

INDUSTRIAL  
DEVELOPMENT  
OF  
JAPAN

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E. BACCHI

# INDUSTRIAL DEVELOPMENT OF JAPAN

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To  
*My revered father,*  
Late Mr. S. S. Bagchi,  
*Gold Medalist—Paris & London,*  
*the Pioneer Silk Industrialist of Bengal.*

This Book  
is  
Most Respectfully Dedicated.



## INTRODUCTION

The author of this book visited Japan and other foreign countries for the study of Sericulture as a *Radhakamohan Foreign Scholar* from the University of Calcutta. In the present book he deals with the phenomenal post-war industrial development of Japan in practically all its aspects. From his own studies the author has supplied facts to counter the allegation of Japanese dumping, which has often been used as a convenient excuse for the inability of some other countries to stand up to Japanese competition. The capacity of Japan to export cheap industrial goods is ascribed by the author to a combination of various factors : to an active interest of the Government of Japan in Japanese industry, to rationalisation, to constantly improving technique, to adaptability to new requirements, to the supply of cheap power throughout the towns and villages of Japan, to the operation of the cottage industries and to cheap and highly efficient labour. The number of spindles per female worker in Japan is the largest in the world. It is pointed out by the author that while the depreciation of the yen has been a helpful factor for exports, it has meant at the same time more expense to Japan in the matter of imports of raw materials, for the bulk of which Japan is dependent on foreign countries.

The special feature of Japanese industry is that about 65 per cent. of the total volume of exports

consist of the manufactures of small and medium-sized industries, each of which employs 5—10 workers. These industries are practically run by families helped by hired workers, who live almost as members of the employing family. These cottage industries are mechanised, as cheap power is available and the use of small motors and machines is universal. The products of the cottage industries are collected, finished, graded and marketed by large-scale organisations. The contrast between such cottage industries and ours is obvious. There can be no question that unless our cottage industries are organised somewhat on the lines of those in Japan, they will never be able to stand the competition of large-scale industries.

One particular feature of Japanese industry is the great interest of the Japanese Government in the development of industry and the control it exercises over industry both directly and through various organisations and by various legislations like the Export Industries Association Law, so as to ensure co-operation and co-ordination, to prevent under-cutting, to provide cheap transport facilities and to obtain cheap export markets generally. The Government has given bounties to various industries, particularly in the formative stages, established an Industrial Advisory Council as a part of the Ministry of Commerce and Industry and has established and subsidized a large number of industrial training and research institutions.

The labour question has also been dealt with by the author. He points out that the wages of the average Japanese worker compare favourably with the income of the average Japanese peasant and he thinks that the existing social and economic condition should be taken into account before deciding that the labour of a particular country is under-paid. While this may be to a great extent true, there is obviously much room for improvement in the condition of Japanese labour, as the author himself admits.

The book is worth reading by the general public and by those who are planning the industrial development of our country at the present time. It is always good to consider the different industrial systems of the world and to apply the good points and principles of other countries to our own industrial development. Both the Government and the public have to co-operate in the matter and if the interests of the Government of India and of the people of India are coincident, as they are said to be, the Government should lose no time in taking at least one-tenth the measures that the Japanese Government has done. Now that war clouds have burst, this is more urgent than ever.

**Syama Prosad Mookerjee**

I would like to avail myself of this opportunity to thank those, who have so kindly helped me in the collection of data and informations. My thanks are due to many Chambers of Commerce in Japan which arranged for my visit to various factories and industrial organisations, and also to Mr. T. Watanabe, the Director of the International Students' Institute of Tokio for very kind assistance.

Lastly, my grateful thanks are due to Dr. Syamaprasad Mookerjee, our ex-Vice-Chancellor who has so kindly contributed an Introduction to my book.

**Author.**

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Bathroom of a Dormitory

Factory Dining Hall

# JAPANESE WEIGHTS, MEASURES AND MONEY

## WITH FOREIGN EQUIVALENTS

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### LAND MEASURES

$$\text{Cho} = 10 \text{ tan} = 3,000 \text{ tsubo} = \begin{cases} 0.991735 \text{ ha} \\ 2.45064 \text{ acres} \end{cases}$$

$$1 \text{ tsubo} = 3.95369 \text{ sq. yards} = 3.305.785 \text{ m}^2$$

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### WEIGHTS

$$1 \text{ Kwamme} = 1000 \text{ momme (Japanese)} = 3.75 \text{ kg.}$$

$$1 \text{ Kin} = 160 \text{ ,, ,, } = 0.6 \text{ kg.}$$

$$1 \text{ Momme} = 10 \text{ fun ,, ,, } = 3.75 \text{ gr.}$$

$$1 \text{ Koku} = 40 \text{ kwamme ,, } = 150 \text{ kg.}$$

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### MONEY

$$1 \text{ Yen} = 100 \text{ sen ( Japanese )}$$

1936 ratio :

2s. 0d. 581 (England)

12.72265 francs (France)

$$1 \text{ Yen at par} \quad 2.0925 \text{ marks (Germany)}$$

0.49846 dollar (U. S. A.)

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## A GENERAL SURVEY OF JAPANESE TRADE

Unfounded allegations are, after all, not fair. Japan is very often accused of dumping, and of inferiority in her labour condition, and various other things as the secret of her commercial expansion ; and these are supposed to have been a serious menace to the world trade. But if the actual conditions are honestly and sensibly studied, it will be found that such allegations are either due to a lack of knowledge of various conditions in Japan, both social and economic, or it is a deliberate propaganda to check Japan's industrial expansion in oversea markets, where some interested parties so long enjoyed either a monopoly or better position in trade. A common allegation is that the Japanese merchants or exporters sell their goods at a lower cost than the actual cost of production, and that the Government helps dumping by way of granting large export bounties. If one honestly desires to investigate into the matter, he will certainly find how baseless these allegations are.

Of course, the depression in the value of yen has given a great impetus to Japan's export trade, but so far as the exchange factor is concerned, pray, is there any nation that has stuck perpetually to the same exchange policy or has overlooked her national interest ?

Then, also, there is another side of the picture. This reduction in the value of yen may benefit Japan in the export of her manufactured commodities, but as every one is aware, Japan has very little raw materials of her own and so she has to buy the bulk of them from the oversea markets. Naturally, therefore, when she buys the raw materials from abroad, she is in the disadvantage of paying more on account of depreciation in the value of yen and thus suffers a great economic loss.

Now, about the inferiority in conditions of labour. Well, so far as the conditions of labour are concerned, they are certainly not inferior in any way when judged from the point of social and economic conditions of the Japanese life. Here it may be asked, if the condition of workers or their standard of living is the same in European and American countries.

The answer evidently will be in the negative, because it can never be alike everywhere as it is always dependable on the social and economic conditions of the country. It is surely desirable that conditions of labour are to be improved, but it can never be brought to the same level everywhere in the world.

The secret of success of the Japanese industry—if there is any secret at all—lies not in dumping, but in the joint efforts of the Government and the people to improve conditions in manufacture and trade through the help of various organisations, education, researches, rationalisation etc.

From Japan nothing is exported below cost, as all things exported pass through the Exporters' Associations, which never encourage such malevolent practices. Of course, as a rule the export price is cheaper by certain per cent. in comparison with the home-market prices.

Formerly a large part of Japan's foreign trade was in the hands of the merchants or exporters, who always followed a meaningless competition amongst themselves resulting in the inferiority of goods, which invariably jeopard-

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dised the reputation of the Japanese goods in countries abroad. To do away with this, the Japanese Government encouraged the formation of Export Associations, and promulgated Export Association Laws in order to put a control on the export trade. And the Export Associations, incorporated in accordance with the provisions of Law, have since received a legal status.

Financial assistance is, of course, granted to the Export Association to a certain extent to enable it to establish oversea branches to supervise the proper observance of agreements, made among the members of the Association in regard to the price and quality of goods. These branches study also the local markets and requirements. The total annual subsidies for the above purpose from 1931 to 1936 are as follows :

1931—Yen	33,000 ;	1932—44,000 ;
1933—110,000	1934—100,000 ;	1935—50,000 ;
1936—47,000.		

Now, Japan exports approximately 2,285 million yen worth of goods to various countries. With such meagre subsidies, one can easily find—if his eyes are wide open, how far the story of

dumping goods may be true. And so far as the state aid to indigenous industries are concerned, Japan is not an exception to grant such aids. Every civilised Government does that, and is morally bound to do so for the well-being of the nation, when the industries are in their infancies.

Now, coming to the point of the standard of living, simply because the standard of living of the Japanese people is very simple and inasmuch as it is not exactly the same as in the Western countries, it should not be a ground to depict her as one responsible for lowering down the general standard of living.

Last of all, it is surely not an offence if the Government stabilises the industries and helps the formation of sound organisations to do away with the malpractices etc.

As an industrial scholar I endeavoured to study the present industrial development of Japan and visited various industrial organisations in Kyoto, Osaka, Kobe, Nagoya and Tokyo ; and the result of my studies and investigations I have tried to put forth in the following pages, which, I hope, will be able to throw some light at least on the subject of Japan's industrial expansion.

## WHY AND HOW JAPAN BECAME AN INDUSTRIAL COUNTRY

Japan, with a population of 69, 251,000 in the main island and about 97,00,000 in the empire of Japan, including Taiwan, Chosen, and Karafuto, had no other way but developing her industries for the very reason of sustenance, although about forty-eight per cent. of her population are primarily engaged in agriculture, sericulture and stock-raising. When the density of population of Japan is compared with that of other countries, it is found that Belgium has got 661, England 865, Italy 308, while Japan 1,156 population-strength per square kilometre. Thus having very little cultivable lands and natural resources to fall back upon, the only way she could find for the employment of her enormous population was in making it an industrial country and thereby to find a solution for the livelihood of the nation. In this also Japan has to face various difficulties, such as securing raw materials from the outside countries. Naturally, she had to



base her national policy mainly on the building of industry, and in pursuance of this policy she established on a sound basis her principal industries, which subsequently helped the growth of various other industries.

The Government, with a view to develop and stabilise the industries, indemnified dividends, and would always encourage the promotion of industries by granting bounties and various other means. Thus Japanese industries, with the help and co-operation of Government, acquired a sound footing in almost all the branches of industries and what she achieved only in the course of last twenty or twenty-five years took other western countries no less than double the time. The well-known saying that "Where there is a will, there is a way", is nowhere truer than in the case of Japan. Japan has proved to the world in all phases of her life that a country of the East can also rise to the zenith in a short decade. She had the will and she has worked out the way. Can any one deny this truth ?

The Government granted a bounty of 20,000,000 yen for the new enterprise of the dye-staff manufacture, and 50,000,000 yen for the

## INDUSTRIAL DEVELOPMENT OF JAPAN

Glycerine industry, which shows how anxious and alert the Government is for supporting the nation in its pursuit of industrial development.

Japanese industries are mostly small and middle-scale industries, which enjoy a cheap power facility, and as such has the advantage of cheap production ; but they also have the counter effects, which are quality-inferiority made for the sake of competition, less purchasing power, slow improvements in technique, want of proper research facilities and the study of market conditions etc.

In order to solve the above difficulties, Government has established institutions for examination of manufactures, institutes for industrial experiments, research, and technical training etc., and also encouraged the formation of Manufacturers' Associations. When a manufacturer is confronted with any difficulty, he can approach the respective Government Institutes or experts of the Associations for different commodities, who will study the matter and give suitable advice to him gratis.

If we survey the organs of such research and technical institutions, we find that there are

no less than two hundred technical schools throughout the country, at least one in each prefecture, which train high class workers. There are about twenty technical colleges, most of which are run by the Government, where the technical experts are trained. Besides, there are six Imperial and two private universities for imparting higher technical studies, where the professors and the research students carry on special research work and publish the results of their labours which have much to do with teaching new ways and efficiently conducting the trade and commerce.

Big factories and companies have their own research laboratories, where capable men are engaged to study various factors relating to their own line of manufacture, a factor which is no less responsible for the present industrial development of Japan. There were as many as seventy-seven such Industrial Research Institutions in Japan at the end of 1935.

Experts under Government and the professors have to tour round different parts of the country, holding lecture meetings and giving demonstrations by means of charts, slides etc.

and thus widening the latitude of knowledge of the people. This naturally leads to improvements in agriculture, sericulture, and silk-reeling industries etc.

The Ministry of Commerce and Industries give bounties for the encouragement of various industrial researches and new enterprises. The Government has also a committee for the investigation and standardisation of the manufactured goods, which had its desired object in the increasing popularity of Japan-made goods in the overseas markets.

This all-round industrial development, supported by proper guidance and rationalisation, has led to the improvement of the economic condition of Japan, and has brought in an advancing tendency in the growth of population, resulting in an average annual increase of about 900,000.

## RECENT ECONOMIC DEVELOPMENT

The present expansion in Japanese trade and industry is due in the first place to the reimposition of gold embargo and then to the decline in the international value of yen, combined with the stimulus of Government expenditures on the manufactures of arms and other relief works. The application of the principle of minimum wages with higher efficiency and state encouragement greatly contributed to the success of the economic recovery plan by rationalisation of production.

To cope with the low tendency in commodity-prices, efforts are always made to bring down the cost of production, which has led to the consolidation of enterprises under the pressure of economic depression.

The Government of Japan is ever alert to maintain cheap money conditions without stimulating speculative excess, which fact, combined with the depreciated exchange rates, helped a good deal in the promotion of the

remembered that though the city folk are becoming fast westernised and consequently crave for higher wages, the labour class in general, belonging as they do to the common agricultural class, and as such accustomed to a simple life, do not up till now consider their existence at all miserable. This will be sufficiently proved, when one visits a factory or a Department store, where the working girls are found always in a cheerful mood. Of course, there are Welfare Work and Labour Union to safeguard the interest of labour. Labour disturbances in Japan are almost rare as the spirit of nationalism is inherent also in the labour and there is a feeling of harmony between the employers and the employed.

Most of the industrial enterprises, save and except spinning, large-scale weaving, rayon manufacture, and heavy industries etc., are but small-scale industries, employing from five to ten workers, which constitute the greater part of the export trade. Such small-scale factories are started in one's own house with a small capital. The workers in such factories live in the same house and enjoy the same facilities as a member

of the house and as such a harmonious relationship is established between the employers and the employed. Such small-scale factories have been possible in Japan as cheap power is available throughout the country, which is generated by the hydraulic plants, owned by various indigenous enterprises. Naturally, when things are produced on the basis of small unit by such small-scale factories, not only the cost of production is minimised, but the output of such factories can be adjusted to market conditions.

Articles like bicycle, produced in parts by different small units are assembled together at one place and exported after test by the Association. Textiles produced by small factories are similarly finished by special finishing-houses and exported under the control of Association.

The sphere of these small industries, which are protected by the Government can be very reasonably called cottage industries, though combined with the latest scientific machineries. They have played no less important a part in the industrial development of Japan. Large companies are distinctly separate in spheres. There is centralised control over

every branch of industries in Japan, which has been of great benefit to her industries. The promulgation of the Industrial Association Law, Revision of Exporters' Association Law, Commercial Association Law, have all helped the formation of various industrial associations and societies, which not only safeguard the interest of the members concerned, but also effect various improvements of industries.

It cannot, however, be denied that Government encouragement is chiefly responsible for the general growth and expansion of Japan's industries. Small factories get the benefit of advice and guidance of Government experts; and the various Associations, connected with the industries, get Government subsidies to run the small organisations in mutual co-operation. The Ministry of Commerce and Industries for this purpose granted 705,170 yen in 1933-34, 587,480 in 1934-35, and 474,500 yen in 1935-36, to the Industrial and Commercial Exporters' Associations that hold control over small and medium enterprises.

Various other new enterprises received similar aid and bounties from the Government,



such as photographic, motor, dye-stuff industries etc. and manufacture of various other things. Besides, aids are granted to the industrial institutions as has already been said.

Then transport facilities at a lower cost constitute a great factor in enabling the merchandise to compete with the foreign producers. So the Government decided to encourage transport and communication by paying considerable subsidies to various companies. The Government granted subsidies to the extent of Yen 11, 719, 835 in 1932-33 ; 14, 073, 426 in 1933-34 ; 14, 245, 764 in 1934-35 ; and 9, 747, 821 in 1935-36, for the improvement and building of shipping transport only. Besides, a sum of about four million yen is granted for the construction of motor roads and air transport subsidies. The freight both inland and by sea are much cheaper than in many countries. This is indeed a great asset to the industries of Japan. So the Government of Japan lays especial stress on this factor, as it has already been said Japan has to depend on other countries for raw materials required for her industries, and the great population of Japan depends largely on industries to earn their

livelihood, nay, it means their very existence. The area under cultivation is not sufficient enough to provide bread for the vast majority of population. Naturally, she has got to develop her industries economically, find overseas markets for her goods, because that alone could solve the problem to a great extent. As she has to buy most of the raw materials, she has to bear double expenditure on transit on most of her exportable goods, except silk and rayon. State-backing is therefore indispensable.

The Government controls volume of manufactured goods, the export prices, and inspects exportable goods. It also helps trade activities by an intelligent study of foreign market.

Then, the provision of law governing debentures and credit facilities to small enterprises and farmers is no less responsible for the economic growth and rural uplift of Japan. At the end of 1935, the total invested capital in joint concerns was 14,197,243,247 Yen or the reserve fund inclusive 17,439,292,716 Yen. The authorised capital was 19,885,777,795 Yen.

The investment of capital and the rate at which Japan's industrial development was

effected will be clear from the following accounts. In the year 1894, there were 2844 companies with a paid up capital of 245 million Yen, which, in the course of the following twenty years, increased by 1,738 million Yen or at an annual average of ninety million Yen. Thus the capitalisation augmented to 6,155 million Yen, the average annual increase being 879 million Yen. Though there was slight depression in the new enterprises during the earthquake period ( following 1923, the year of the earthquake ), followed by the world-wide depression, the post-war reaction, the condition of trade was after all much improved about 1930. It was followed by a gradual increase of fresh companies and further expansion of capital, so that at the end of 1933, the total number of companies came up to 71,196 and the investment of capital in the year was 525 million Yen. But in the following year there was a stupendous rise in the investment of capital as will be shown from the figure itself. The amount of capital invested in the year rose to 1082 million Yen. About 85 per cent. of the capital invested in business enter-

prises represents the capital of the jointstock companies.

The paid-up capital of jointstock limited partnerships in 1934 was 1,565,159,000 Yen and from January to November, 1935, was 1,108,269,500 Yen. At the end of November, 1935, the number of jointstock companies were 31,923 with a paid-up capital of 20,815 million Yen. It will be interesting to the readers to note the capitalization of companies with reference to the capital invested. The figures given here are for 1934.

### Capital (in Yen)

		500,000	1,000,000	5,000,000	10,000,000	50,000,000	
	Less than	to	to	to	to	to	Oyer
Number of	5000,000	1,000,000	5,000,000	10,000,000	50,000,000	100,000,000	
Companies	50,625	6,599	9,085	1,955	2,198	308	405

Among industries the gas and electric hold a predominant position with a capital of about 2,237 million Yen, which represents about half the total of industrial capitalization.

The effects due to higher cost of raw materials and other economic depression were effectively overcome by rationalisation, which

enabled the industrial concerns to reduce their number of workers. For instance, in the textile industry the number of spindles per female worker increased from 35·3 in 1926 to 46·5 in 1929, and to 61·1 in 1934, and to 62·5 in 1935, and a similar advance per capita efficiency was discerned in weaving and other industries. This materially helped Japan to compete with other textile producers of the world.

About wages : The average income of a male labour in Japan is 1·35 Yen, and of a female ·68 Yen per day. Average wages paid to labour is 12 Sen per hour and for different industries they are as follows :

Textile 7 sen, metal 19 sen, machine and tools 20 sen, chemicals 14 sen, timber and wood 13 sen, printing and book-making 21 sen, food and beverage 13 sen, and other industries 10 sen.

As a result of economically working the factories, number of factories steadily increased. In 1914, the number of companies were 31,717 ; in 1919—43,949 following the conclusion of the last European War ; in 1925—49,161 ; in 1928—55,948 ; in 1929—58,887 ; in 1930—62,234 ; in

1934—64,436 ; in 1935—85,174 ; in 1936—90,602 ; and in 1937—106,005.

About workers employed : 55,374 factories engaged 30-50 heads each, 6,503 engaged 50-100 heads each, 1,343 engaged 100-200 heads each, and 1,215 more than 200 heads each, in 1931. There were 2,369,277 workers in 1935, out of which 1,287,575 were males and 1,08,170 were females.

Statistics reveal that there were 667,205 workers employed in factories with more than 200 heads each, the figure representing 40·2 per cent. of the total number of labourers, whereas there were 484,306 workers or 29·2 per cent. employed in factories with five to thirty heads each. Number of workers employed in plants with thirty to hundred employees stood at 326,121 or 19·6 per cent. These workers are engaged in different industries, such as spinning and weaving, metal, machinery and tools, ceramics, chemicals, lumber, food, gas and electric, printing and book-making etc.

In the spinning and weaving industry 82·4 per cent. operatives are females, whereas in other industries the proportion of female opera-

tives varies from 7.1 to 54.3 with the exception of gas and electric.

About equipments : in 1932, out of 64,486 factories 53,422 were equipped with motive engines, but at present ninety per cent of factories are equipped with motors. Out of a total number of 106,005 factories in 1937, each with five or more workers, 91,618 were equipped with motive engines.

When studying the Industrial development of Japan, one could not but be struck that Japan, hardly bigger than the province of Bengal (in India) and with an enormous and ever increasing population of eight hundred million, in constructing her new industries, never lacked foresight. She did not commit the mistake of developing her industries on a line, which could neither stand against foreign competition, nor could establish oversea markets ; she was rather too quick to take the help of machines and motive power wherever necessary, and the majority of her industries though running on a cottage industry basis enjoy the present day facilities of other advanced countries. It's indeed a lesson for India to learn.

## A STUDY OF INDUSTRIAL POLICY

Without proper control over the industries through associations and guilds, influenced and aided by Government, no industrial enterprise can ever thrive in any country. The secret of Japan's industrial development and success lies in this very factor, whatever a propagandist might say in order to lower her in the eyes of the world.

At the close of the last European War, Japan was faced with a severe economic distress and various other difficulties, which acted as an eye-opener to her and convinced her that without central economic control in respect of supply and demand, and rationalisation, industrial development would be impossible. As such Government intervention was essential; and control by the Government materialised in



1930. In January, 1930, Government took a positive step and inaugurated the Industrial Advisory Council for rationalising the industry as a part of the Ministry of Commerce and Industry.

A careful survey discloses that this step enabled the Government to supervise and regulate exportable industrial commodities, as well as to exercise control over the small industries. Industrial organisation was further consolidated by the promulgation of the Major Industries Control Law.

The bulk of the Japanese industries comprise small and medium industries, which, in the absence of central organisation and control, were always liable to a cut-throat competition, and consequently the foreign trade was much hampered. This led to the promulgation of the Export Industries Association Law, the object of which was to encourage the formation of associations to facilitate the joint and economic installation of modern machineries and their improvement and also to promote rational management in industries. Such associations also control the production and sale.

Then again, the trade depression led the Bureau of Rationalisation to organise committees to supervise and reform small industries engaged in the manufacture of staple articles for export. The members of these committees are but manufacturers and parties interested, whose task it is to devise concrete plans for centralisation of control. Thus centralised control was effected by amalgamating local associations into one National Federation. Such centralised control applied not only to the small scale industries, but was extended to the large scale industries also by the Major Industries Control Law. Consequently, in the industries cartels were formed, which brought about improvements in the organisation of the industry, and the federation controlled production quotas, prices, selling conditions, division of markets, centralised distribution, joint purchase of raw materials, and joint storage etc. The cartel agreement is, however, subjected to modification by the Minister, when found prejudicial to the interest of industries.

More than fifty per cent. of the Japanese export-goods are produced by the small and

medium industries, and the centralised control over the export trade encourages co-operation by uniting together a self-governing body of exporters. Such Associations have the authority and power to exert control over the non-members in respect of exportable goods, and any one disobeying the rules of the Association is liable to punishment by Government.

Besides these, the Japanese Government also endeavours to secure agreements in respect of export-quantity with other foreign Government to protect the interests of their export trade.

The Export Association not only rationalises the manufactures and supervises export-goods, but regulates the foreign trade also. For instance, regarding Japan-India cotton tissues, the Association controls the volume of goods exported to India. The Japanese Bicycle Exporters' Association controls volume and price for oversea markets and the Federation of Japan Central and General Goods Exporters' Association works for the establishment of trade compensation fund. The promulgation of the Exporters' Association Law marked an impor-

tant step in the organisation of the industries of Japan.

By rationalising the industries method of scientific management was first introduced and the whole range of industries were brought under rational organisation. Japan got this instinct from Germany and her activities resulted in the group organisation of Japanese modern business.

A special organisation was also established by the Government for the comparative study of foreign and domestic manufactures and their direct improvements. Measures were also taken to utilise more home products, and steps were taken to enable people to distinguish the home product from outside products.

Technical skill was raised for the manufacture of export-goods, and from all directions efforts were made to produce things at the minimum price with maximum standard of efficiency on a co-operative basis, and the Bureau of Industries under the Ministry of Commerce and Industries functions for the realisation of that object. This Bureau attends to the regulation of cartels, the application of scientific management, the

improvement of financial facilities, and matters relating to the rationalisation of merchandise, propaganda for the products, improvements, and to co-operation of industrial research institutes. The efforts of the Bureau have resulted in the establishment of co-operation and control among almost all the leading industries.

There is also the Factory Management Committee, which carries on research work concerning scientific methods of factory management, and the results of its labours are utilised by factories in general.

Owing to the depreciation of the value of Yen, which resulted in advancement of price for imported articles, Japan encouraged the use of home-made goods, and this helped her to get considerable market at home and in oversea countries.

In a nutshell the mechanisation of the industry, combined, by thorough rationalisation, with cheap and fairly efficient labour, has led Japan to her present day industrial success, and this is why it has been possible for her to effectively compete with the market of the world.

## PRODUCTION RELATIVE TO DEVELOPMENT OF INDUSTRIES

The growth of industry and expansion of foreign trade, both during and after the Great European War, show a remarkable progress in the trade of Japan, attaining the fullest development in 1925, which year showed an estimated production of about 12,330 million Yen. The pre-war national production of Japan was only 3,100 million Yen, which when compared with the figure of 1925, would record an increase of more than four times. The foreign trade totalled 4878 million Yen, which is also about four times the previous figures. During 1926-28, a slump was witnessed in the trade, the effect of which was a reactionary decrease both in import and export, but however in 1929, the total production again touched the level of 12,915 million Yen, and the foreign trade advanced to 4,451 million Yen.

The remarkable fall in prices due to diminished purchasing power and deflation, caused by the world-wide depression, considerably increased the industrial production from 1929-31, and in case of external trade the rate of decline was greater—e.g. by 45 per cent. against production of 35 per cent.

The position was recovered in 1932, the former position being reversed, and the production of 1933 recorded an increase of 32 per cent. over that of 1931, while an advancement by 59 per cent. was seen in the foreign trade. The value of production in subsequent years is estimated to have been increased by 20 per cent. and the total for 1935 showed over the production-cost a favourable margin of about 15,000 million Yen. The foreign trade at this time reached 4970 million Yen, which was higher by 18 per cent. than the previous year.

As in other countries, foreign trade plays a very important part in the industrial and economic development of Japan and this unprecedented growth of foreign trade is greatly due, among other things, to low cost of motive power etc. With the advancement of export

trade the expansion of industries was but natural, and the year 1935 recorded in the volume of industrial production an increase by 42 per cent. and in export by 75 per cent, as compared with 1931. Then also the primary and industrial products, both in production and export trade, show a tendency of advancement, which indicates the industrial growth of the country.

The world-wide depression greatly affected the output of industrial products, but however, Japan, through her policy of thorough rationalization in all stages of the industries from purchase of raw materials to sale of finished products, cheap transport, both inland and overseas, co-ordination, and running of various organisations in connection with industries on co-operative basis, arrangement for advancing finance to industrial organisations etc. steadily regained her lost position. In 1925, the output of primary products was of 5,790 million Yen, which declined to 2,882 million in 1931, but in 1933, it again rose to 4,063 million Yen. During this period the industrial products remained unaffected and kept on steadily increasing which reached 10,836,894,120 Yen, in 1935.



The domestic output of primary products are food stuffs and a few raw materials. In case of the former, Japan is self-sufficient, but in case of the latter she is not.

The trade balance in primary product-import, shows an increase to 1,541 million Yen in 1935, over 674 million Yen of 1931, while this is counter balanced by the great advance of export of 1013 million Yen in 1931 to 2,285 million Yen, in 1935.

In 1929-31, the manufacturing industry of Japan was only affected by depression, but otherwise could be able to make a fair development.

During the Great War, Japan enjoyed an unique position in the trade, which was benefited with remarkable expansion, but on the conclusion of the war, she had to meet the same depression like other countries of the world, the post-war reaction. This period is between 1921-25, but however, from 1926-29, production showed an increase by 31 per cent in volume and 8 per cent in price. From 1929-31, the output again decreased by 9 per cent, in volume. From 1932 the position much improved and in 1933,

the production advanced both in quantity and value. 1934, and 1935 also made a steady headway, and the production estimated during 1935, to be 11,000 million Yen.

Amongst Japan's industrial production the textile industries occupy a predominant position, followed by the chemical industry; next to which comes the food stuffs and provision manufacturing. Metal, and Mechanical Engineering industry also made a great stride in recent years, and the respective percentages were as follows :

Textile industry	36.8 per cent.
Chemical industry	16.7 „
Food stuff and provision industry	12 „
Metal industry	11.4 „
Mechanical Engineering	9.7 „
Other industries	11.4 „

The following tables showing export to and import from different countries of the world, which will further clear the position of Japan's trade in 1934 and 1935 :

(In 1,000 Yen)

COUNTRIES:—	Export		Import	
	Year 1934.	Year 1935.	Year 1934.	Year 1935
East Asia	553,579	624,835	312,546	353,176
Manchuko including Kwangtang and leased territory.	853,953	886,614	191,491	216,522
China	117,063	148,788	119,574	133,818
India & Ceylon	258,012	287,524	291,960	308,425
Strait Settlement	63,320	48,536	63,320	40,648
British Malaya	x	2,413	x	28,495
British Borneo	300	545	7,304	9,832
Netherland East Indies	158,451	143,041	63,464	78,187
French Indo-China	2,654	4,021	10,621	15,011
Phillipines	36,461	48,058	18,891	23,949
Siam	28,048	40,258	1,540	5,458
Hawaii	5,526	7,242	47	0
Brazil	20,013	28,603	12,128	16,371
Africa	182,397	183,528	79,574	69,186
Turkey	2,194	3,241	1,973	1,036
Aden	9,353	13,208	27	364
Syria	11,699	12,599	68	31
Palestine	6,412	8,400	2	3
Iraq	17,165	22,073	26	1,258
Iran		6,592		729
Arabia and Other countries	12,682	5,471	9,568	434
		8,614		471
Australia	64,462	74,793	197,758	235,128
New Zealand	18,588	11,305	11,594	6,354
Other Islands	1,309	2,153	4,790	7,137
Great Britain	109,270	119,458	70,037	82,160
France	38,319	42,468	18,300	19,809
Germany	19,677	26,766	109,584	120,818
Belgium	9,675	15,393	17,227	24,562

COUNTRIES:	Export		Import	
	Year 1934.	Year 1935.	Year 1934.	Year 1935
Italy	9,579	6,989	3,461	5,832
Switzerland	307	471	10,925	13,456
Austria	198	308	3,542	4,409
Czechoslovakia	41	78	1,756	2,331
Netherlands	17,883	18,316	3,652	5,873
Sweden	6,113	6,785	21,140	23,074
Norway	2,828	4,482	14,280	19,941
Denmark	1,262	1,359	1,657	522
U. S. S. R	13,005	28,319	40,809	17,904
Other countries of Europe	8,787	14,579	10,034	13,950
North America	398,928	535,389	769,359	809,645
South and Central America	104,752	109,388	24,818	50,941
Canada	8,666	7,977	54,094	52,531

## ECONOMIC FACTORS AFFECTING THE COST OF PRODUCTION IN JAPAN

Cost of production of a manufactured article comprises of the cost of raw materials, wages, cost of fuel or energy, and overhead charges.

Generally, in Japan, the cost of raw materials represents about 60-70 per cent, wages 10 per cent, and energy or fuel about 2 per cent.

The countries that possess the supply of raw materials of their own are remarkably in an advantageous position over those who have to depend for the supply on other countries, and naturally, the former enjoy the benefit of low cost on raw materials. This favourable position of having the resources for raw materials put countries like Great Britain and America to favourably compete in the world

market. The countries that are handicapped in the way of getting the supply of raw materials at a comparatively cheaper cost can only compete with those countries which enjoy a favourable position, having their own supply, by means of rationalisation of the industry and low wages.

A large portion of raw materials for industrial purpose has to be imported by Japan, and high cost of such raw materials tends to advance the price further on account of the decline of Yen value. The increase of price in raw materials is reflected in the export price and Japan being placed in such a handicapped state had but to think of solving this difficulty by means of efficiency of labour and cheaper cost of production by rationalisation, other scientific improvements, and cheaper energy etc.

The economic depression of the country not only brought down the wages, but increased the working hours at the same time. This decline in the wages naturally replaced male labour by female labour, and labour with higher technical knowledge with ordinary cheap labour, though however, with the improvement of industries,

condition of labour has much been elevated. Practically speaking Japan adjusted herself and overcame all unfavourable conditions by systematic study of her difficulties and through perseverance, which led to her gradual recovery of position in the world market.

For instance, in the cotton industry only, the number of spindles per female worker increased from 35.3 in 1926, to 46.5 in 1929, and 61.1 in 1934, and a similar improvement in weaving was also effected, and the proportion of female labour in cotton industry advanced from 77.5 per cent in 1929 to 83.8 per cent in 1933.

Japan's wages also greatly cheapened by the decline in exchange rates and more than fifty per cent of the labour being cheap female labour placed her in a favourable position to compete in the foreign markets.

The average working hours in Japan is 62.21 hours and the wages paid per week to cotton spinners is Yen 5.8 at par, while Great Britain pays 18.0, and U. S. A. 35.0, and India 5.5 Yen, respectively.

Japan's textile, woolen and other cottage

industries require a comparatively small fuel and power outlay as the cost of electric power generated by hydraulic system is extremely cheap throughout the country, which has made the industries possible to keep down the fuel expenditure, excluding gas, below 2 per cent of the total value of the gross output on average. Eightyfour per cent of the power required for industries is Electric power, fourteen per cent Steam power, and two per cent Internal Combustion power. The wholesale rate of power is between Yen 0.01-0.05 per kw, in some industries according to the volume of consumption however, the rate is as cheap as Yen 0.005 to 0.007 per kw.

One of the other chief factors leading to Japan's industrial success is the development of domestic machinery industry, advanced by extensive research for which encouragement is accorded by Government in the shape of subsidies etc, to individual concern or research institutes; and this enabled Japan to acquire machineries and equipments at a very reasonable price, which is about one fourth the price of the machineries produced by



America or other European countries. One may naturally ask about the efficiency and durability of such machineries. To answer this question, it will be quite apt to say that if these machineries were defective and inferior, how could it be possible for Japan to manufacture better quality things by such machineries and compete in the world market.

It will not be out of place to say that in some branches of the industries, like cotton and artificial silk, the result of rationalisation, technical progress and scientific management are attributable, while in other branches of industry, such as the small-scale factories for the production of sundry goods, the involuntary competition in underselling has gone to such a length that the products are offered for sale at extremely low prices. It must be admitted that the low exchange rate of the Yen, and low wages are contributory causes.

## JAPAN AS MANUFACTURER OF MACHINERIES.

When the production of machineries in Japan is studied, it is revealed that the origin of all the heavy industries rested in the transplantation of western civilisation into Japan, through the great Emperor Meiji, who was the maker of modern Japan.

The enormous stride in progress however, is found to have actually been started only after the Great European War, whence forward she began manufacturing most of the machineries with the exception of a few. In 1931, when the war broke out in Manchuria, all the heavy industries had undergone a speedy but complete transformation to enable the country to be self-supporting, and this would be distinctly conceivable from the following.

The strength of the factories engaged in

manufacturing machines and instruments in 1932, with five workers were 6,738, which leaped up to 7,850 in 1933, and this showed an increase of 16.5 per cent over the previous year. In that year quite a number of new factories were added to the existing number. It will further be clear from the output of 1931, 1933, and 1935,

ARTICLES	1931	1933	1935
Motors	22,215,098	59,365,582	43,405,085
Internal Combustion Engine.	18,494,447	48,147,236	47,469,011
Mining Machineries etc.	2,047,128	6,190,028	14,326,438
Instruments and Machine-tools.	3,944,923	15,403,826	14,625,
Machine for Chemical Industry.	2,638,421	14,341,447	23,577,954
Gauges and Meters.	6,811,607	13,279,122	10,545,729

As machine-tool has a great bearing upon the munition industries, Japan is sparing no pain to become self-supporting in this line, and playing an important role in the industries of aeroplanes, arms, and battleships etc. The demand of machine-tools has placed Japan in a position of turning out high class delicate machineries like microscopes, X-Ray apparatus

etc, and she has paid more attention to mass production by which greater efficiency could be attained. She is at present exporting a large quantity of machineries, as plaining machines, microscopes etc, to America, India, China and other Oriental countries.

Japan is manufacturing all kinds of Electric Motors, Internal Combustion Engines, Diesel, Petroleum and Gas Engines etc, and for encouraging such manufactures subsidies are given by the Government. Japan has manufactured for her vessels the Double-acting Two cycle Diesel Engine, and could produce a cylinder as big as 760 mm, in diameter that enabled her to occupy a leading position in the world.

During the first part of her enterprise, Japanese machineries were estimated to be inferior in quality, because of defective casting, but she started a thorough investigation and overcame the problem. At present Japanese machineries are not inferior to those made in Europe and America, particularly when the cost is considered. For the investigation and improvement purpose various research organisations for the study of metallurgy have

been started and they are devoting to the advancement of technical skill. As a result of study, centrifugal-casting methods has been recently applied to cast iron and steel pipes etc.

The production of different kinds of Engines during 1933 and 1935 are as follows :

	1933	1935
Internal Combustion Engines	48,147,263	47,649,011
Gas Engines.	116,780	43,260
Gasoline Engines.	32,360,597	22,077,424
Petroleum Engines.	4,049,818	6,624,639
Diesel Engines,	11,620,068	15,618,500

The enormous stride in ship building is also remarkable on the part of Japan. All the Japanese vessels, which now stand in position to be third from America and Great Britain, are built at home, and the Japanese Armada or submarines etc, are manufactured by herself. The Ship Improvement Subsidy has given a great impetus and resulted into the prosperity of Japan's ship-building industries. Of late, Japan has also turned her activities in manufacturing Whaling crafts for the Antartic region and her crafts most successfully completed the voyage in the Antartic in 1936, and 1937. Japanese spirit

is that she wants not to fall behind any enterprising nation of the world, and this is the keynote of her successful achievements.

Spinning and weaving machines, manufactured in Japan, are found to be most popularised not only in the Empire of Japan, but in South and East America, China, Russia, Phillipines, India and even Manchester. This fact sufficiently proves that the workmanship of Japan-produced spinning and weaving machines are in no way inferior to those produced in America or England. Not only these machines are perfect, but they have to their credit low production cost, combined with efficiency of work. The spinning machine manufacturing companies always endeavour to place superior machines on the market.

Japan took up the manufacturing of Cotton Spinning machine only in 1921, at the end of the Great European War, before which she imported all her spinning and weaving machineries from Europe, especially from England. During war, she purchased her machineries from America, and the handicap which she experienced during this time induced her to adopt a policy of being self-supplying. Thenceforward she endeavoured her

most and produced the most superior high-drought-ring-spinning frame that enjoys self-supplying and self-supporting advantages in the entire process of cotton spinning.

It will not be an exaggeration to say that the superiority of Japan-made weaving machines led Platt Brothers Company to buy the production right of the Toyoda's Automatic Loom. Machines, such as Intersecting Gill-boxes, Drawing frames, Roving frames etc, are in leading position, and Messrs Societe Alsacienne, the famous French concern are getting all their manufactures made in Japan under special contract. Toyoda is not the only factory producing better type of spinning and weaving machineries. There are other equally reputable manufacturers, which are manufacturing high grade spinning and weaving machines for cotton, wool, worsted, silk, and rayon.

Not very late, when Japan took up rayon manufacturing, she imported the machines from England, America and Germany, but the ardentness of Japanese manufacturers soon enabled Japan to produce machines necessary for the increase of production and expansion at a

much lower cost, which enabled her to compete with other manufacturers of the world.

To the credit of Japanese manufacture of faultless machineries, the 'Asahi' aeroplane, 'Kamikhaze', completely built in Japan, made a London-Tokyo flight in 94 hours, 17 minutes, and 56 seconds, covering a total air expanse of 15,357 kilometers, setting a new world record, in 1937.

Though however, it is a fact that some of the machineries are inferior to foreign products, when one takes into consideration the price of these Japanese machines, he will find that the price is lesser than two third. So long the machineries had been chiefly manufactured to cater the home market, and as had already been said that the majority of factories in Japan were small scale factories on the cottage industry basis, it was beyond the power of such factories to buy costly machineries. Since new development, extensive research is always carried on in the manufacture of machineries, and improvements are constantly being effected ; and such machineries owing to its comparative cheapness can be replaced by the small factories whenever required, without embarrassment in capital.



## HOW JAPAN THRIVED IN COMMERCE AND INDUSTRIES

Japan's long strided progress in commerce and industries may be traced back in various factors, but the most outstanding one which can never be ignored is the effect of the Great War.

During the War of 1914, in which the whole Europe was involved brought about a standstill to the European manufacturing industries, while demand for various commodities enormously increased both in Europe and other countries that mainly depended on the supply of the European goods. This was a great opportune moment for the industrial development of Japan, and she did not lose the far sight of it's importance in building up the future of the nation.

In order to meet the outside demand new

enterprises were started and heavy industries were run day and night at full capacity, which naturally enabled her to earn an enormous profit. The conclusion of War no doubt brought a great slump on Japanese industries like other countries, which benefited by the War, but by that time Japan made no less than 3,000,000,000 Yen in gold. This enormous profit enabled her to spend some part of it towards the improvement of equipments, both from the point of improving the quality and curtailing the cost of production. At the end of War, when the other nations re-established their business enterprises, Japan lost a considerable oversea market on account of inferiority in the quality of goods.

This set-backing opened the eyes of officials and other businessmen, who greatly endeavoured to adopt correctly the industrial technique of the advanced nations like Europe and America, and thereby improved the quality of the Japanese goods.

Last European War also acted as an eye opener to the statesmen and Japan became fully convinced of the very fact that the modern war

was but a war of science and depended much on the industrial strength. Japan turned to devote to extensive researches of technique and promoted the home industries.

National expenditures for institutions encouraging inventions were granted, and nationwide efforts were made for the elevation of industrial position of the country. Though in subsequent time, Japan faced various odds and ends, her indomitable spirit and co-operation of the workers, enormously helped in striding an unanimous effort towards the assets of Japan.

The nation alaways attended to the progress of the industrial education and development, and fitted the form of production to suit the conditions of Japan, and she did not follow the foreign techniques without a fore-sight. At the same time, she carefully investigated the purchasing power and demands of foreign markets etc. She is well alert in the production of arms for self defence and at present is supposed to be quite independent of herself, even in manufacturing aeroplanes, powerful artilleries and submarines etc.

Then again most of the Japan's manufacturing industries are produced in middle and small scale cottage industry system as has already been mentioned, which are finally finished at the finishing centres ; or articles like bicycle assembled into one unit at other place. Such small industry concerns are well organised under the protection and guidance of Industrial Societies and Guilds. Here lies the cause of cheapness of many Japan-made articles, which find an easier access into the oversea markets, and inasmuch as the purchasing power of most of the nation has fallen low ; and this is not because of Japan's dumping, which is so often heard against her.

There are honest labour behind the enterprises, indomitable spirit in overcoming adverse situations, unanimous support of the nation, hearty co-operation of the workers, and at the same time Japan is not shy of investing capitals in her new enterprises.

No one can ignore the measures taken by the authorities for promoting industrial growth of Japan. Government enterprises in establishing and maintaining model factories, sending out a

large number of students for technical education to foreign countries, protective tariff, aid to industries, and engagement of experts and specialists from foreign countries etc, and all these may be said to be the pillars of the present day Japanese industry.

## RATIONALISATION IS THE CAUSE OF JAPAN'S INDUSTRIAL SUCCESS

The industries of Japan are showing a great activity at present, which fact indicates but an improvement in Japan's economic life, and this is due to rationalisation in various enterprises and factory management.

When we study this factor, we find that for materialising the above, Government has enacted various laws for major industries' control, which govern spinning and other industries throughout the country through various associations connected with the industries. These associations have Central Board of Federation of Industrial Associations for improving the position of the retail merchants.

There is also special Industries' Control Law, for the benefit of the industries. The

support of industrial enterprises by such laws and associations have made it possible on the part of the industrialists to exert efforts in bringing down their cost of manufactures in various ways. The Government is not merely framing laws for governing industries or commerce, but actually takes initiative in the improvement of industries.

The joint possession of equipments, co-operative purchase, and sale of manufactures, have greatly helped towards economising the expenditures towards the cost of production. The Industrial and Commercial Associations negotiate fund for financial aids to industrialists and traders of lower and middle class.

For effecting rationalisation attention has been paid for standardisation of products, simplifying the manufacturing process, improvement in technique etc, and these factors are studied by industrial research organisation. There are various industrial associations and institutions, which are working towards the same object.

For the rationalisation of factory management, the Japan Industrial Association investigates into various conditions through experts,

which includes Government engineers and other experts of various firms, factories and associations. In every prefecture there are Industrial Society and Society of Industrial Research, which are in co-operation with Japan's Industrial Association, and they all attend to the above matter. Then also Japan Industrial Efficiency Society and Japan Industrial Association by distribution of pamphlets on self-investigation of factories do much good to industrial concerns.

The rationalisation of factories include efficiency of equipments, rational process of manufacture throughout, research within the factories, and use of waste.

It is desirable to mention here that through the help of Government and various associations, industrial concerns are protected against falling a victim to mechanical advancement or such other unavoidable factors.

The cheapness of the Japanese goods and her industrial achievements may chiefly be attributed to rationalisation, improvement of techniques and efficient labour at a comparatively cheaper cost. Due to the rationalisation



and amalgamation of industries the cost of production could be reduced to such an extent that the Japanese goods were enabled to undercut competitive industries of other countries, and this could be possible for the efficiency of organisation.

Japanese industries faced quite a number of difficulties in past years, which include the post-war depression, financial panic of 1927, and the deflation following upon the gold embargo in 1930 etc. During this time quite a number of less stabilised enterprises were victimised, but this led to the industrial undertakings on a firmer foundation, based on rationalisation and amalgamation. This was started by reducing the cost of production by replacing old machineries with those with greater efficiency, waste elimination in every field of manufacture and management.

The rationalisation in Japanese industries has not been stopped with the present achievements. It is progressing further and will undoubtedly enable Japan to reduce the cost of production still further, increasing the competing power of the Japanese commodities, which is

considered to be a veritable menace everywhere. The present position of the Japanese industries may be said to have acquired a position for her to compete in the world market on a fair ground and by legitimate means. Rationalisation has been possible due to co-operation of industrialists and worker, and also because of the desired quality of Japanese labour.

From the export and import figures already furnished, it will be found that Japan's trade balance is mostly against her, the imports being in excess of exports. If this be the position, then how can Japan cause a menace to other countries by her export trade? On the other hand Japanese exports claim that they might reasonably raise the purchasing capacity of the countries, which supply Japan with raw materials. It will not be out of place to quote a few lines here from the article on 'Rationalisation', by Mr. Sanson, the British Commercial Counsellor in Tokyo.

"In most of the important manufactures there was a serious and on the whole successful effort to improve organisation and technique to economise labour and to reduce costs".

"The quality and variety of Japanese manufactures have improved at a remarkable rate. Since the national energies have been devoted to this end for long past, there has now grown up a generation equipped with the necessary knowledge and skill, which is able to profit by experience—both the achievements and mistakes of other industrial countries".

"Though the fall in the exchange value of the Yen was in many cases the chief reason for this success, its underlying cause is the increased efficiency."

"Today small boys make wireless sets and are interested in any kind of mechanism ; and even if most modern factory processes demanded more than the ability to repeat one simple operation, they would present no serious difficulties to a deft-fingered people, who have been unrivalled craftsmen for centuries".

"It is not lack of adaptability on the part of her workers which will set limits to the industrial expansion of Japan ; and as for the leaders of industry, if one may judge by results, Japanese directors, managers and technicians are not wanting in skill and enterprise. If they are

deficient in such respects, their fault will not stay uncorrected for want of energy and determination”.

Not only in cotton spinning and weaving a thorough rationalisation is remarkable, but in every manufacturing industry during recent years rationalisation has led to increase in productive efficiency by the improvement of both labour and machines, which have evidently decreased the cost of production. From the following, it will be clear how Japan has saved labour in case of only cotton spinning industry.

The process of spinning has been so much simplified that one man is sufficient to look after the machine, and the raw cotton fed into the machine automatically comes out thoroughly mixed without any trouble. Formerly, this work was attended to by several workers.

In blowing section also two processes serve the purpose instead of three in the former time. In course of roving, one process has been eliminated by the introduction of simplex fly frames and this has not only saved labour, but motive power too. Then also it used to take four processes in finer counts and three in

grosser counts. Japanese cotton-spinning concerns have reduced them to two in case of the former and one in the latter. Productive efficiency in the fine roving section has been increased by the introduction of the high-drought systems.

From the article of Mr. K. Imamura, "Mechanical improvement and its effect on the Cotton-spinning industry", a comparison of the usual equipments, and also the simplex and the high-drought systems of a factory having 30,000 spindles and spinning twenty counts, the efficiency question will be further clear.

	Usual Equipment	High- drought only	Simplex and High- drought
Machines required	284	252	240
Operatives required	258	156	143

This has resulted in the following decrease in the cost of production per bale.

	Usual Equipment	High- drought only	Simplex and High- drought
In case of 20, S	Yen 25	Yen 22	Yen 30

It has also increased the thread length by fifteen per cent. and attended by only two girls instead of six in the former time.

The process of winding has been done away with in case of warping, which is now directly done by the cheese bobbins. The warping creel has been also improved. Automatic looms produced in Japan are now extensively used, and also autocloth guider is used. Naturally, the per head productive efficiency of the worker has been greatly increased. The use of automatic loom with greater efficiency has also decreased one third the wastage of yarn, as compared with 1913-15.

As has previously been mentioned that the efficiency of Toyoda automatic loom is known to be of very high order, and this is why Platt Brothers bought Toyoda's patent to sell these looms in England.

The writer himself in order to make a first-hand study visited the Khanegafuchi Cotton-spinning and Weaving factory of Kobe, and Toyoda Cotton-spinning and Weaving factory of Nagoya, and the investigation led to reveal the following :

Khanegafuchi mill, though started with machineries imported from foreign countries in the past, have at present considerably

replaced them with home-made machineries of higher efficiency.

The mixing and cleaning of different grade of cotton are at present done by home-made machines and in such machines the working operation needed is only the occasional feeding.

In this mill five combing machines are attended by one girl. The roving is completed in two processes, and 124 roving sets attended to by one girl. In Khanegafuchi, looms were found to be home-made Toyoda looms or of Osaka Kikai Kosokosen, although some old looms of Platt Brothers were in existence, and on enquiry it revealed that the old looms were being gradually replaced. In the spinning section ring-spindles are chiefly used, which are high-drought automatic ring-spindles, and a set of 424-440 such spindles are attended by one girl, and the maker of these spindles is the Osaka Kikai Kosokosen.

Here the warping is directly done from cheese bobbins and from 39,000 to 45,010 yards of warping is done in one day of eighteen working hours, divided into two shifts, and each of the warping machines is attended by one girl.

In this mill Platt Brothers warping machine was found to be used.

For starching also Japan has produced as equally efficient machines as of foreign make, and both home-made and foreign starching machines were found to be used here.

In weaving from 18-20 looms are attended by one girl, which produce about thirty-eight yards of plain cloth, and in this mill most of the looms, found to be used, were made by Drapper Hopedale Mass, though some of the Toyoda looms were also used.

The Khanegafuchi Mill works in two shifts, one from 5 a. m. to 2 p. m. and from 2 p. m. to 11 p. m.

In Toyoda Spinning and Weaving Mill of Nagoya, sixteen combing machines were found to be attended by one girl. Each roving machine is attended by one girl and is of higher efficiency. Here two cropping machines with 240 spindles, and two sets of high-drought spinning machines, each having 120 ring-spindles, are attended by one girl. In starching section also three starching machines are attended by two male operatives, and the starching machines have a speed of



35-45 yard working capacity per minute. These machines are also specially designed by the Toyoda works.

In weaving Toyoda automatic self-shuttle-changing looms are used, and these looms have a maximum capacity of weaving 72 yards of plain cloth per day. According to the width and texture of the cloth from 17 to 32 Toyoda looms are attended by only one girl. These looms are automatic shuttle-changing looms with much greater efficiency than those produced in other countries.

The Kanegafuchi and Toyoda both use overhead conveyers. The above facts will testify how the Japanese cotton industry came to occupy a superior position over other countries.

Then again a Japanese cotton mill is not only engaged usually in spinning and weaving of cotton, but the recent tendency is to undertake artificial silk manufacture, silk spinning, staple fibre-making etc.

In spinning, Japan uses more than 96 per cent. of ring-spindles. A comparative study of the Japanese and English cotton industries, based on the lecture of Mr. Y. Shikamura, as publish-

ed by the Shinyo Chosa Kokyu Kwai, Tokyo, in 1933, will be found interesting. The statement is based on figures for one year ending 31st January, 1934, of the International Cotton Spinners.

	JAPAN	ENGLAND
Raw cotton consumed	3,094,000 bales.	2,440,000 bales.
Number of Spindles.	8 million,	50 million (one third of totalspindles of the world)
Spindles, Mule 4 per cent, Ring 96 per cent.		Mule 76 per cent, Ring 24 per cent,
Looms	300,000 (about half automatic)	650,000 of which 30,000 are automatic.
Unit	71 establishments, Capital per concern is 7,680,000 Yen,	207 establishments, Capital per concern is 2,550,000 Yen
Control	Japan Cotton Spinners' Association has a strong power of control.	English Cotton Spinners Association has not got so much consolidated control.
Labour	15 per cent. male operatives, 85 per cent. girl operatives. Labour is being always replaced by girls fresh from the country, and as such wages are low.	Male operatives 35 per cent. Greater portion of the workers are advanced in age, or higher technicians with higher pay.
Looms per head.	Ordinary looms per head 8, Automatic looms 20-35.	Looms per head 6

In Japan's cotton industries, there exists no middle man to be given commission, and the mills also have a big reserve fund, which enables them to instal necessary improvements by up-to-date equipments etc. The investigation of the author into other industries disclosed the following conditions.

### ELECTRIC BULB

In Electric Bulb manufacturing, the tube-flare is made by girls or young boys and about 6,000 of such tube-flares are made by one unit in ten hours' time, who receive about 70 sen wages per day.

The bulb-stem-making is completed by two girls, who can produce about 4,000 pieces per day, and they get about 80 sen per day. The top and bottom wire-holders are fixed by machine and operated by one man, the capacity per head being 4,000 pieces per day, wages 1.50 Yen per day. The filament is fixed by hand by the girl worker, who has a similar capacity, and she earns about 1.30 Yen per day. Exhausting and tempering of the bulb is done

by two men, whose wages are about 2 Yen per head, and they can make about 4,500 pieces per day. Flashing is done by the women labour, who get about 60 sen a day. Welding, testing, marking etc., are all done by girls, who get on average about 70 sen per day.

### CHINA-WARE

The writer visited the biggest porcelain article manufacturing factory at Nagoya, and was much impressed by the improved technique, methods of working, and skill of the workers. The ovens used were electric chambers in which the heat could be regulated and uniformly applied. Naturally, when such mechanical efficiency and skill are combined, it reduces the cost of production and percentage of wastage.

Inside the works conveyers are used and the time lost in production has been largely saved, and the breakage in carrying is also considerably reduced. On the porcelain wares decorative designs are painted by hands as well as fixed from designed printed papers by efficient girl workers.

## JAPANESE GOODS

Now, regarding the quality of the Japanese goods, some people think that they are generally inferior in quality, and that Japan has specialised in Woolworths. This is a mistaken idea of those who overlook facts. Japan can produce anything within the purchasing power of the respective countries, and she can efficiently produce both costly things and cheaper things. The allegation might have been true some fifteen years back. A barrier is often created against Japanese imports with high tariff wall, which naturally leads her to produce cheaper things by which means alone she can depend on oversea market. If some particular thing of about the same worth produced in Japan, is compared with similar things of other Western countries, it will be found that the Japanese goods are in no way inferior, on the other hand considering the price paid for them, they will be found to be quite worth while.

Japan not only produces, substantial merchandises for industrial purposes, but she

manufactures her own battle-ships, locomotives, aeroplanes etc., for her defence.

In every industry the object is to produce better articles at cheaper cost, and all the manufacturers strive to conform to this end ; and they get full co-operation from the workers, and Government.

## LABOUR

Japanese people are, by nature and habit diligent and frugal, and they do not generally clamour for working long hours. If any worker clamours against work, he or she is detested. This industrious nature is also chiefly responsible for Japan's industrial success.

The worker in Japan is a keen competitor and he always tries to produce better things in a shorter time than his fellow-brothers of the same factory. He will always cherish an idea to give his factory the credit of A-I, among the factories of the same company. In his very heart every Japanese cherishes the desire to place Japan on the fore-front.

In Japan competitions are frequently held in private factories and Government offices (such as post offices), and the merit is duly recognised, and impetus given by suitable awards.

The aspiration of Japanese worker is not limited, and he always tries to improve by acquiring better knowledge, and thereby raises his position and status. The worker gets sufficient encouragement from the employer, which contributes a good deal towards the fulfilment of his aspiration, resulting in the development of Japanese industry.

For instance, among the employees of the Omiya workshop of the Government Railways, about fifty to sixty people receive rewards for useful inventions or improvements every year. This railway work has the following Committees composed entirely of workmen for different lines of work, as stated below.

Names	Object
Mutual Enlightenment Committee	Improvement of work in general, and increase in efficiency.
Economy Committee	Economy in materials, and stationery, use of by-products and idle stock.

Names	Object
Safety Committee	Industrial Safety
Works Committee	Improvement in the methods of working tools and machineries.
Process Committee	Time table and manner of work.
Locomotive Committee	Construction and repairs of locomotives, carriages etc.
Carriage and Van Committee	
Electric Committee	Rationalisation in repair work.
Locomotive Overhaul Process Committee.	

The above committees hold monthly or bi-monthly meetings to discuss methods and merits appertaining to improvements etc. There are special laboratories where the workmen during off-duty study various things under the direction and assistance of superior officers.

Outwardly Japanese people seem to be slow at work, but in fact they are steady, and at the same time they are conscientious of their duty and will never while away their time during duty hours.



## WAGES AND LABOUR CONDITION IN JAPAN

Many people have the impression that the conditions of labour in Japan is of a very low standard and it is for such labour exploitation that Japan is enabled to effectively dump the merchandise in the oversea markets.

The condition of labour should be judged from the standpoint of social and economic conditions of the very country to which the labour belongs. It is a mistake to compare the condition of labour of two unlike countries, which are different from each other by the very social and economic conditions. Even when one compares the condition of labour in Russia, Germany and England in the continent of Europe, it will be found that they are not alike. Then also the working condition of a

country depends on population, employment question, natural resources, area, industrial development, and social custom etc. When one considers about the labour condition of Japan and her wages, he should not ignore the facts involving the above points.

When the wages of a worker is considered, how far it can satisfy his wants should be estimated. A hasty comparison of wage-rates is absurd, when national habits and needs are not duly taken into account.

With the advancement of industry, which may be said to be the life-line of the Japanese people the wage index of Japan, taking 1913 as basis, will be found to have risen to 142 in April of 1934, (as stated by the *Ashahi* newspaper). The condition of labour in Japan is not at all unsatisfactory or condemnable. Where it apperas to be lower out-wardly, carefully studied, it will be found to be otherwise and the so-called inferiority is made up in various ways, and the workers enjoy a standard of life comparatively higher than that of other classes of his countrymen.

In Japan there exists the feeling of fellowship between the employer and the employees, which is the outcome of the spirit of old Japanese family system.

No Japanese worker is found lacking in nutrition, physical energy and mirth. Ordinary Japanese people have a very simple standard of living, their house is simple, furniture they require very few, have simple inexpensive diet, but it does not mean that they are not enjoying an elegant mode of existence. Wants may be said to be one's own creation, and it depends on the habit of the people. Japan is even now contented with simple habits and less costly mode of living ; but times are rapidly changing in Japan, the youngsters by the imitation of Western habits look upon multiplicity of things as the determining factor of happiness. When this will confront the whole working class, Japan has to think of a means of solution of this problem.

Workers in Japan are healthy and happy, and they enjoy an elegant life.

As elementary education in Japan is compulsory, the labour is fully conscientious of their

own interests and position, and will never endure unjustified state of things.

Farmers and peasants occupy 48 per cent. of the total population of Japan against which Industry and Commerce claim 32 per cent. From this fact it is evident that the most powerful factor in determining Japanese wages is the condition of agricultural population. When wages are considered from this view-point, it will be found that the factory wages in Japan is not unjustifiably low. In many cases industrial labour gets more wages than people in other pursuit of life.

The factory workers' wages are also closely related to the income of other members of the society and can never be unreasonably increased without increasing the general standard.

In order to refute the assertion that Japanese labour is cheap, Japanese capitalists say that the scale of wages there is not low compared with the conditions of living of the nation as a whole. They compare the standard of living of the factory worker with that of the peasant, and use that comparison as an argument to prove that, since the income of the industrial

worker is higher than that of the agricultural worker or other section of the working population, the question of cheap labour does not arise. This explanation could however be accepted, if it were simply a question of conditions of labour within the boundary of Japan, but as the question is an international one, the capitalists of Japan owe it to themselves to improve further the labour conditions. That wages are low in Japan is an undeniable fact when it is compared with other Western countries.

The low exchange value of the Yen, low wages, long working hours, the industriousness of the workers, Government subsidies to the export trade, and unfair methods of competition are mentioned among the factors contributing to the progress of Japanese export trade. The low exchange value of the Yen and the so-called inferior labour conditions are specially attracting attention of other nations. As regards the low exchange rate of the Yen, it is in reality of little benefit to Japan, because this fall is common to the currencies of all the countries that have left the gold standard, and Japan has never deliberately adopted any policy

to bring about such a condition. Moreover, this might be said to be a temporary phenomenon. The most important factor contributing to the progress of the Japanese export trade is but the low cost of production.

The cost of production in different countries is dependent on various elements, and in every country there is a sort of national standard of wages, which serve as a basis for all wage-scales in the various industries. So, it is not fair to compare a particular industry of one country with the same industry in another and to conclude that one is founded on cheap labour, while the other is not, and that one lowers the standard of living of the other country. The comparison must be done on the basis of the national standard of wages in the two countries. From that point of view, it is important to note that the national standard of wages in Japan is based on the income of the peasant. Peasants constitute the majority of the working population of Japan, and the basis of wages is thus to be sought in agriculture. As agriculture in Japan is not very profitable, the whole scale of industrial wages starts from

a low starting point and therefore cannot rise very high.

Now let us see what the reason for the very low standard of agriculture in Japan is. It is not due to bad agricultural methods. The population is so large that each peasant has at his disposal only a very small plot of land. Since the great Meiji restoration, the population of Japan has doubled. There were 33,000,000 heads in 1872, 35,000,000 in 1878, 44,000,000 in 1888, 50, 000,000 in 1908, 56,000.000 in 1918, 64,000,000 in 1930, and 67,000,000 in 1934. This increasing population is crowded into a very small area, there being an average of 169 persons per square kilometre. As the area of the arable land in the mountainous archipelago is 50,000 square kilometres, the area under cultivation per head is extremely small, being 7.5 acres only. This is less than Great Britain's, where only seven per cent of the population depends on agriculture, whereas in Japan more than half the population is agricultural.

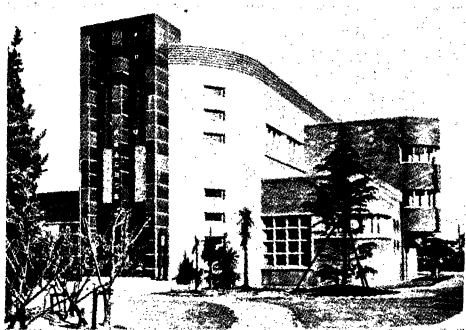
Still more important reason for their low standard of living is the agrarian situation in Japan. Economically, atleast, the Meiji Restora-

tion did not make the farmer free, since almost immediately they were forced to rent land and to pay an exorbitant price for it ; but however, their burden became stabilised in the sense that the rent was fixed in advance.

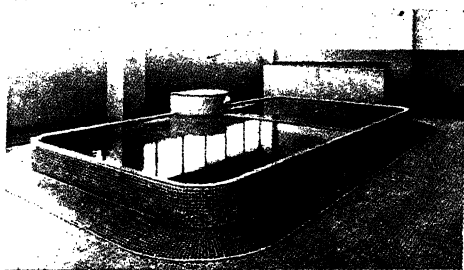
The extremely small piece of land that the average farmer of Japan cultivates at present can not sustain him and his family. In 1933, twenty-seven per cent of the peasants were landless, and of those who possessed any land at all, 49.7 per cent held land up to a little over one acre each, representing only nine per cent of the total arable area, 42.12 percent had from one to eight acres of land each, while the remaining 8 per cent of the total number of the land-owners held over one half of the entire area under cultivation. Of that half, almost fifty per cent was owned by a small group representing one per cent of the total number of the landlords.

For a number of years the cost of production, including rent, taxes and interest on mortgages, was actually higher than the market-price, obtainable for agricultural products. The hardship of farmers have become further intensified by fall in the price of agricultural products





Dormitory of a Cotton Mill



Bathroom of a Dormitory



Factory Dining Hall



owing to the universal depression. Rice and silk cocoons constitute the most important items of produce with Japanese farmers. The Government is making unceasing effort for maintaining the price of rice and cocoons, but so far it has not been able to attain its object. Due to the depression in the United States, where the bulk of Japanese raw silk is exported, and for the remarkable development of the artificial silk-industry, the price of cocoons has been following a downhill course for the past several years. Under such circumstances, it is quite natural that farmers should desire to become factory hands

To-day farmers and peasants occupy 48 per cent. of the total population of Japan. These farmers and peasants desire to become factory workers at the first opportunity. It will, therefore, be seen that the most powerful factor in the determination of Japanese wages is the condition in agricultural districts, and the national wages level in Japan cannot be raised as long as the reserve workers exist.

In Japan the workers are comparatively young as they enter the factory just after the

completion of the primary school course, and the duration of employment is also short. The number of workers advanced in age are much smaller in comparison with other countries, and about half the factory workers in Japan are females, majority of whom work for three to five years till marriage, just after finishing the elementary education in order to accumulate some money for marriage or in order to help their parents. This short duration of service of the workers proportionately lowers the average earning figures. The duration of work of about 72 per cent. of the female industrial labour in Japan does not exceed five years.

The family system in Japan has made it possible for the workers to be satisfied with low wages, as they live in a joint family under the same roof. When discharged, about 40 per cent. of the discharged workers return to agriculture, 13 - 15 per cent. find employment in other factories having the same nature of work, about 8 - 10 per cent. find employment in other kinds of industry, and 14 - 15 per cent. are otherwise employed.

Wages-level in Japan has not considerably

increased on account of depression in the price of agricultural products ; but in some particular industries, where technical labour is involved, the wages showed an increase, which will be verified by the following index number of wages, as published in the statistics of Factory Labour by the Bank of Japan. The wages are on the basis of hundred in 1926.

#### INDEX NUMBER OF WAGES

(actual earning)

Year	Machineries	Ship- building	Vehicle	Metal work	Tools and Instruments
1931	89.4	86.6	85.0	93.7	86.1
1932	96.3	90.6	85.9	94.2	87.8
1933	100.6	97.1	89.5	96.3	89.3
1934	96.6	98.4	87.5	98.0	85.3
1935	93.2	98.7	82.0	98.1	82.7

In 1934, the machinery industry showed a little decline whereas the rest prospered.

Average working hours in Japan may be said to be nine hours though in actual practice some will be found working less number of hours and some more.

In cotton-spinning industry the working hours have been reduced to eight and a half hours, since 1930. In silk filatures, the working

hours are about ten hours ; in textile factories the usual working hours are nine hours, but in practice many work from eight to eight and a half hours. In mines the scheduled working hours in the pit are ten hours, but in fact about eight hours are actually devoted.

The following table will show the actual working hours of factory labour in Japan, which has been taken from Rodo Tokei Yoran (Statistics on labour).

#### WORKING HOURS IN VARIOUS INDUSTRIES

(1933-1936)

Factories	1933	1934	1935	1936
Average	9·13	10·11	10·14	10·14
Ceramics	8·56	10·00	9·58	9·57
Metal	9·04	9·57	9·58	9·55
Machine and Tools	9·28	10·13	10·16	10·12
Ship-building	8·40	9·37	9·41	9·42
Chemicals	9·08	10·07	10·05	10·04
Textiles	9·33	10·26	10·30	10·32
Clothing	9·10	10·13	10·20	10·14
Paper and Printing	9·25	10·18	10·19	10·23
Leather	8·56	10·07	10·17	10·10
Wood and Bamboo	8·58	10·16	10·15	10·10
Food and Drink	9·00	10·16	10·19	10·18
Construction	—	—	—	—
Gas, Electricity,				
Water	9·00	9·59	10·01	10·06
Others	8·47	9·52	10·02	10·00

As regards the rest of labour, law provides two days' rest in case of female and juvenile labour (below sixteen years of age), but there is no such provision for adult workers. However, in practice weekly rest is allowed in big factories, and in case of small factories and business houses, two days' rest in a month is given, which also varies according to season.

In coal and metal mines weekly rest is allowed and according to the statistics of factory labour prepared by the Bank of Japan, the following are the average number of working days in one month (November, 1933).

	Working days
Average of 150 mines	26·8
Average of 168 Government factories	25·3
Average of 3,574 factories	27·3

So far as the wages and the cost of living are concerned, if one takes into account the low cost of general living in Japan, owing to the internal condition and practice of the country, it will be found that there is not much inferiority in regard to wages in Japan.

The wage index in Japan, based on one hundred in 1914, as compared with the United

Kingdom from 1929-1934, will be found as follows :

Year	Japan	United Kingdom
1929	298·9	193·7
1930	274·0	191·8
1931	246·7	189·3
1932	236·4	185·8
1933	239·9	183·4
1934	237·4	183·3

The above figures are from the Department of Commerce and Industries, and the London and Cambridge Economic Service Report respectively.

It is also found from the annual report of the Director of the International Labour office, Geneva, that the Japanese wages in 1931 were almost equivalent to those of Poland and Italy in the value of gold.

Real wage index of industrial labour in Japan shows a tendency of steady rise with the development of commerce and industry, and this very fact accounts considerably for the rise in the standard of living of the Japanese workers.

When considering wages in Japan, one should take into account both basic and supple-



mentary wages. The latter kind includes overtime pay, special allowances, bonuses and payments in other shape, which are intensively in practice in Japan, and they may be said to constitute an indispensable part of a worker's earning. Workers on piece job receive extra wages for overtime work, and the supervisors receive a monthly allowance.

Bonuses vary according to the condition of trade, value of worker's service and length of service etc. In some cases the bonus system has taken a profit-sharing form. Money wages are also supplemented to a great extent by the supplies of materials in the shape of payment in kind.

The factories or the employers make various provisions for welfare-service in order to grant facilities and amenities of life to the workers. This is a voluntary work in moral obligation and perhaps for this very feeling of kinship between the employers and the employees, that such things as strikes and disturbances in the labour are few and far between in Japan. This welfare-work is said to be the outcome of traditional paternalism, which persisted through the period

of development of large scale industries along with the sense of greater responsibility on the part of both the employers and the employed.

Law provides only for discharge allowance (two weeks' wages), industrial accident prevention, and sanitary arrangements.

The various welfare items, which are found to have been provided for the benefit of the Japanese labour are as follows :

1. Housing accommodation for workers, dormitories, free water supply, supply of food at a reduced cost, free electricity etc.

2. Discharge or retirement allowances, long service bonuses.

3. Medical aid, provision for hospitals for workers in the factories, appointment of doctors and nurses for medical aid to workers, leave on half pay at the time of maternity (for females).

4. Supply of articles of daily necessities and articles which are required for factory work (factory dresses), below market prices through Co-operative Societies.

5. Provision for schools, lectures, lessons, newspapers, periodicals, and publication of factory paper etc.

6. Enforcement of the laws of hygiene and steps for the prevention of industrial accidents.

7. Workers' club, amusement rooms, entertainment by cinemas, concerts, picnics, sports and festivals.

8. Employers' contribution to Mutual Assistance Societies and other donations.

In Japan, workers are paid discharge allowance when they retire either for personal reason, old age, or on the expiry of the contract period. The allowance is given in accordance with provisions of regulations, which vary according to establishments, the length of service and efficiency of the worker etc.

The average remuneration for those discharged after twenty-five years' service, according to the statement in the 'Economic Conditions in Japan', will be found below.

#### DISCHARGE ALLOWANCE ACCORDING TO DURATION OF EMPLOYMENT

Length of service	Average wages allowed for
20 years or more	Over 541·7 days
15            "	"   372·4   "
10            "	"   207·6   "
7             "	"   142·1   "

Length of service	Average wages allowed for
5 years or more	Over 95.1 „
3 „	„ 57.8 „
1 „	„ 27.9 „
Less than one year	15.7 „

Regarding dormitories and other welfare-works the following are based on the first-hand knowledge of the writer, who visited Kanebo, Kanegafuchi, Toyoda, Katakura and Gunmasha silk filatures, and other big factories of Japan.

Unmarried workers of both the sexes are given housing accommodation in dormitories, and as for the married workers some factories allow them to occupy company houses on a nominal rent. The dormitories, which the writer visited, were situated on a spacious ground and were three or four-storied well-ventilated buildings, equipped with running water, wash-stands, clean and tiled bath-rooms, closets, large and sunny toilet rooms. The rooms and corridors of the dormitories are cleaned by the occupants and they were spotlessly clean. The whole building is lighted with electric lights and each room in the dormitory has a space of 15 *tatamis*

(mats), and one person is entitled to a space of one and a half *tatamis* (about 27 square feet), and this space is meant for sleeping. Each worker is provided with a chest of drawers or a small almirah fixed up in the walls of the room ; one is used for keeping sundries and the other for keeping the beddings. Beddings and quilts were clean and they were provided by the factories. The dormitories have attached gardens, dining hall, washing room, and some of them are provided even with swimming pools.

Inside the factory compound there is a well-equipped hospital with a staff of physicians, nurses and midwives etc. In most cases sickness and injuries are treated in accordance with the provisions of the Health Insurance Act, and the members of the workers' families receive treatment at a reduced cost.

Most of the factories have common dining-halls for the workers, while there are special rest-rooms with benches for workers, who bring their mid-day meal to the factory. Some of the factories have special auditorium ; but occasionally the dining hall is transformed

into an auditorium or recreation hall. They are spacious and well-lighted.

Substantial food is supplied thrice to the workers by the factory Management, in the morning, mid-day, and evening, at a nominal cost of 17 to 20 sen per day. Here also the factories bear a considerable part of the expenditure for supplying food to the workers at a reduced cost.

In the company shops general merchandise, food-stuffs, toilet articles etc. are sold to the workers at the cost price and consequently the workers obtain their daily necessities at a much cheaper price than the ordinary market rate.

In the factories the employers provide for the education of the workers and their children, and in large factories day nurseries and kindergarten schools are found. Various other facilities are granted for the improvement of knowledge and education of workers.

The following shows the result of investigation by the Industrial Welfare Society, regarding educational establishments in factories employing over hundred workers,

## Number and kind of Educational Facilities

Nature of Factory	Number of factories Investi- gated	Continua- tion Schools	Enginner- ing Schools	Training for girls	Lecture meetings, and clubs	Libraries	Factory Maga- zines
Silk-reeling	830	166	131	723	957	359	109
Spinning	238	137	19	692	533	158	77
Weaving	213	19	6	185	190	54	6
Machine & Tools	290	49	43	43	153	52	26
Chemicals	283	19	10	55	140	55	14
Other Textiles	104	10	3	52	67	27	4
Food & drink	68	8	6	5	35	10	4
Miscella- neous	144	12	3	22	52	22	11
Gas & Electricity	23	1	2	6	14	7	3
Government	74	56	65	49	162	56	22
Total	2,267	4,77	2,88	1,832	2,303	8,00	2,76

In addition to vocational training, factory Management organises such classes as sewing, knitting, cooking, nursing etc. for the benefit of the women workers. There is also arrangement for higher education for the women workers. To add to the amenities of life there are pingpong, organ, basket or volley ball, tennis, base-ball, wrestling, and fencing etc. Women workers are also given lessons occasionally

in some factories in music, flower arrangements, and tea ceremony etc. Most of the factories have some kind of shrine or temple, where the workers offer prayer, and occasionally religious functions are held there. Theatrical performances are also encouraged and workers are entertained with cinemas, educative lectures and such other things.

Physical exercises and dancing have almost become general in most of the factories and some of the factories have made it a rule that the workers must take an open air exercise for at least ten minutes at the beginning of the factory work in the morning or before lunch time.

Then there are welfare funds for organising the welfare institutions, and the funds are usually made up of the contributions from the Management and the members. The subsidy by the Management is often almost equal to the total contributions of the members, which vary from five to twenty sen per month per head. Mostly, the Chairman of the Society is the Managing Director or the President of the Company, or the Work-



shop manager, while the Vice-Chairman is either elected by the board of councillors, or appointed by the Chairman.

Young girls, who have just completed their elementary education, are recruited for mills and factories from rural districts by the factory agents. These girls undergo an apprenticeship for a period of two or three months, when they receive about 45-50 sen per day. They are provided with costumes in spinning and weaving factories or other special works, once at the time of recruitment, and subsequently they are to buy it from the Management at a reduced price. Out of daily wages of 45 sen, they have to pay about 17-20 sen towards their three principal meals, which are supplied by the factories.

During the first year they get about three increments, each after three or four months, according to the efficiency they acquire, the increment being about 8-10 sen each time. After the first year one increment only is given and this also depends on the efficiency of the worker.

At the Kanebo mill of Osaka the writer was shown a pretty good chest of drawers and two

sets of bedding kept in a glass-case in the dormitory, which any girl worker could get after five years' satisfactory work in the mill, and this, the Management gave the author to understand, was a sort of marriage gift to the worker by the Management of the mill.

The average wages paid to labour in Japan are about 12 sen (equivalent to one and a half anna in Indian currency, and 1·6 d. in English currency) per hour, and the wages paid in respective industries are as follows :

Textiles 7 sen, metals 19 sen, machine and tools 20 sen, chemicals 14 sen, timber and wood 13 sen, printing and book-making 21 sen, food and beverage 13 sen, and other industries 10 sen each. Average of male labour's income is 1·35 Yen per day and for a female '68 Yen per day.

The following exchange rates will help one to find out the respective costs in different countries.

EXCHANGE RATE ON APRIL 20TH, 1937

1 Yen—100 sen.

On London ( per Yen )	1 s. $1\frac{3}{8}\frac{1}{2}$ d.
On France                   "	6·33 Fcs.
On New York (per 100 Yen)	\$ 28 $\frac{5}{8}$
On India                   "	Rs. 77
On Australia (per Yen)	1 s. 5 $\frac{7}{16}$ d.

## SMALL INDUSTRIES

The majority of industries on which the industrial population of Japan generally depend can be said to be the small industries, which are run on the basis of cottage industries in small or medium factory scales. Such factories engage about 62·5 per cent. of the total number of labour consumed by the entire factory labour and the majority of such factories are worked with five to ten heads.

It is also very interesting to note that about 65 per cent. of the total volume of exports comprise the manufactures of medium and small industry enterprises. Such factories have become very popular in Japan, as they can be run in a part of the house, which not only curtails all sorts of overhead expenditure, but has the advantage of whole-time supervision also.

Save and except a few commodities, as paper, window-glass, cotton-spinning and large scale

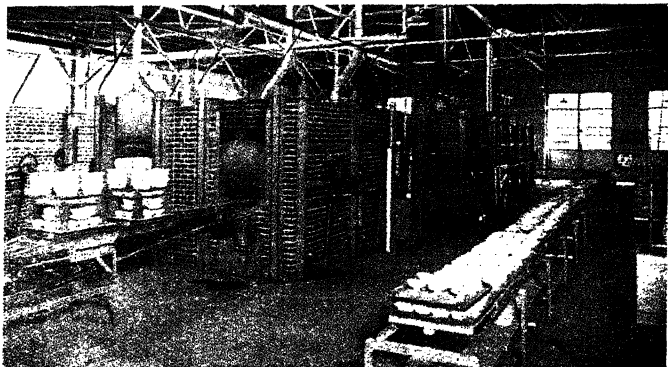
weaving, rayon or staple fibre manufacture etc. which require a mass production, most of the industrial products are turned out by the small scale factories. Provisions, silk, rayon or textile fabrics, bicycle, hosiery, rubber goods, celluloid articles etc. are all produced by the latter.

The existence and thriving of such small enterprises has been possible in Japan, because cheap electric power, produced mostly by the hydraulic plants, is available throughout the country, even at the remotest corner of a village and for communication facilities.

Most of the plants of small or big factories are worked by separate electric motors, and these motors or such motor-driven plants or machines are available from the home market at a considerably cheaper price. The small enterprises not only cater to the domestic market but largely share the export trade of Japan.

Changes in taste can quickly be adapted to at a very low cost in the case of small industries, and new improvements in the manufacture of silk, cotton or rayon fabrics etc. are also possible at less initial expenditure and troubles.

Japanese industries obtain cheap labour



Pottery Plant



Laying Silver Bands on a Copper Vase  
in Cloisonne Manufacture



supply of both males and females from the agrarian class, and this enables them to maintain a low level of industrial wages, but one should not however forget that such workers have also received the compulsory elementary education, which includes knowledge of elementary physics, chemistry, and other useful subjects and are therefore literate enough to grasp the principle of their work.

On the other hand the traditional family system of Japan with the fundamental principle of common support largely contributes to the maintenance of demand and supply relation in industrial labour. As has already been said, factory workers live in the dormitories of the factory in case of big factories, or they live as members of the employer's family. In the latter case also it is advantageous to both the employers and the employed.

Minor industries in Japan have been built up just like a household industry, which also engages apprentices, who are provided with lodging and boarding, and a nominal pocket allowance.

Small industries produce various such

articles, which being ultimately assembled into one final unit at other place or finished at a finishing factory, find their way to market. Such factories work in co-ordination with large enterprises and eventually are in a position to produce articles at a cheaper cost.

Then also the industries are very well organised under Co-operative Societies or other industrial organisations. About ninety per cent. of the Co-operative Societies in Japan are agrarian Co-operative Societies.

As the enterprises are well organised, the small factories can be effectively directed to produce some definite article for the supply of some particular country, and as they are finally supervised, or finished at a particular authorised centre, things very seldom have the chance of differing in shape, size or quality. In case of difference they are rejected for exporting purpose.

In Japan, there are many small factories which are still in the stage of domestic industry, employing less than ten workers to which the Factory Act does not apply, and in these small factories, the condition of labour is not so



satisfactory as in the big factories and at the same time these are difficult to be supervised.

Today, the anarchical condition of competition amongst the small scale factories is gradually being removed by the action of the Government, and by the results of the struggle itself. But these small-scale factories are still practising unrestrained competition, and they are making extreme efforts to reduce the cost of production and they can scarcely do this except at the expense of the labour. On the other hand the large-scale factories have been able to achieve appreciable and yet reasonable reduction by means of technical improvements and increased output per worker.

The Japanese Government have already made considerable efforts to rationalise the organisation of these factories, and impose a minimum selling price which eliminates the more unsound factories and enables all to avoid depressing conditions in labour excessively. It also appears to be inclined to take more direct action to improve the conditions of labour in small factories.

## COTTON INDUSTRY

The important position of Japan's cotton industry will be clear from the fact that out of her total export, twenty-four per cent. represents the export of cotton goods, and Japan is the second largest consumer of cotton next to America.

Her cotton industry was first initiated in 1863, when only two hundred spindles were imported from Platt Brothers Limited of England. By the impetus given by the Government and the efforts on the part of the people, steadily increased the number of spindles, which in 1887 were 84,000, and in 1896, 1,150,000 in sixty-seven plants, and by the end of 1910, there were two million spindles, which increased to more than ten million in 1935.

Japan seized the opportunity of the last Great War and enormously developed this industry with constant efforts and thereby obtained the control of the Asiatic markets. Subsequently, the world-wide depression following the war led her to thoroughly rationalise the industry by increasing the number of ring-spindles, and by improvement of factory equipments, lower operating cost, and better quality of output.

The following table will give an idea of the progress in this particular industry during 1925-1935.

Year	Number of spindles (1000)	Factory Equipments and Looms	Consumption of Raw cotton (1,000 Kwamme)
1925	5,447	73,381	136,065
1929	6,837	77,898	157,682
1932	7,965	79,277	156,372
1934	9,531	91,146	193,219
1935	10,649	95,982	200,321

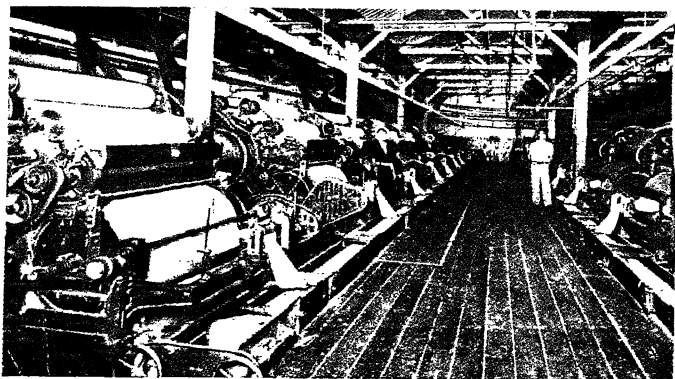
1 Kwamme = 8.27 lbs.

The present position of the Japanese cotton industry will be further clear from a comparative table with other countries, and the figures furnished here are for January, 1936.

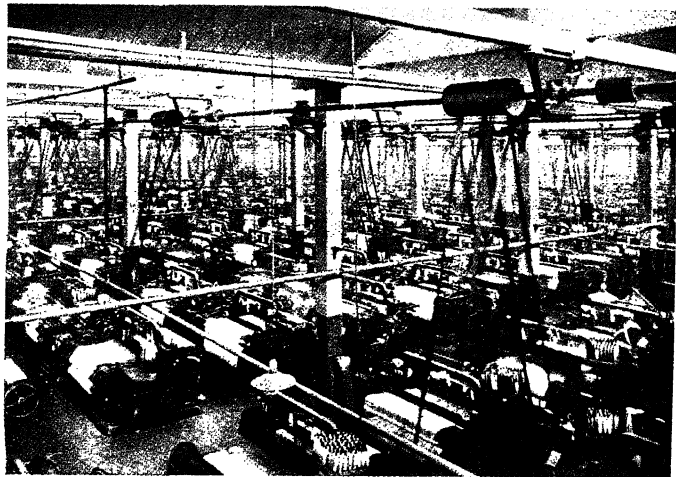
Countries	Ring spindles (1,000)	Mules (1,000)	Consumption of raw cotton (1,000 bales)	Looms
Great Britain	11,045	31,262	2,604	560,153
U. S. A.	28,640	400	5,661	608,815
Germany	6,846	3,263	—	225,000
France	7,588	2,428	1,109	198,200
U. S. S.	6,613	2,187	2,155	259,000
India	9,090	596	2,921	189,040
Japan	10,560	35	3,649	86,343
China	4,952	0	2,358	42,596

Japan's enterprise in the field of manufacture of cotton goods has placed her in such a position that she could get buyers in every country all over the world owing chiefly to her low price in comparison to the quality of goods sold by other producers of the world.

Most of the spinning enterprises are Joint stock Companies, the number of which at the end of 1935, was about seventy with an authorised capital of Yen 1,253, 743, 560, and paid-up capital of Yen 865, 729, 655, and a total reserve fund of 360, 340, 806 Yen, which is more than one third of the paid-up capital, and this fact clearly testifies to the strong position of the companies. There is a tendency towards large-scale enterprise, which has increased the number of such companies as possess more than 300,000 spindles.



Interior of a Cotton Mill



Cotton Weaving Factory



The most important characteristics of the Japanese cotton industry are large scale production of yarn, and the extension into the kindred activities as weaving, dyeing and finishing etc. The equipments are highly efficient, less costly and are produced in Japan. The increase in output has been possible for higher efficiency and rationalisation, leading to a considerable saving of overhead charges.

In Japan the cotton-spinning companies do their own weaving and most of the concerns are provided with bleaching and dyeing sections. Some of the companies in addition spin worsted and spun silk-yarn and the number of spindles for silk-spinning are 430,000. With the prosperity of rayon market some of the cotton-spinning companies took up the manufacture of rayon for self-supply, and this could be possible due to the extraordinary financial position of the Companies. Japanese industries could make a considerable saving due to improvement of factory buildings, lighting, better methods for air conditioning, adoption of individual motor drive in operating individual machines, high speed winding and warping frames etc.

During 1935, Japan produced 1,843·5 million yards of cotton tissues and 3,560,800 bales of yarn,—*coarse*, 20 *S*, *medium* and *fine*. With the improvements, a gauze and standardisation system was adopted. One of the remarkable features of the Japanese industries is that in introducing foreign methods she completely harmonises them with her own suitability and requirements whereby she can easily succeed in realising the lowest cost of production in the world.

In case of wages, she has cut down the wage expenditure for one thousand spindles by 42 per cent. or less than half of what it was formerly and in weaving about 40 per cent. The reduction of the cost of production is not only due to low wages, but this has been greatly helped by the indirect cut through expansion of managing units, avoidance of waste, improvements of machines and equipments, and by the reduction of the power of consumption. All these facts have enabled her to reduce the cost by some 50 per cent. A table of wage, costs and labour efficiency for spinning and weaving industries will be found interesting.



Wage Costs and Labour Efficiency

	MALE WORKERS		FEMALE WORKERS			TOTAL		
	Number per 10,000 spindles.	Daily Wages.	Number per 10,000 spindles.	Daily Wages.	Daily wage Expenditure per 10,000 spindles. (in Yen)		Average costs.	Daily output per spindle, (in momme)
<b>Spinning Industry</b>								
Dec. 1929.	56.2	1.59	206.0	1.14	323.90		23.0	78.6
Dec. 1934.	23.4	1.36	162.0	0.75	153.05		24.5	81.9
Dec. 1935.	22.5	1.354	160.0	0.737	147.57		25.3	79.5
<b>Weaving Industry.</b>								
	Per 100 looms	Daily wages in Yen.	Per 100 looms	Daily wages in Yen	Daily wages Expenditure per 100 looms in yen		Output in yard per loom	
December 1929.	12.5	1.62	50.2	1.27	83.88		66.17	
December 1934.	6.4	1.38	39.1	0.80	40.30		65.27	
December 1935.	5.8	1.384	37.5	0.368	36.82		69.87	

In 1934, Japan had 241,240 broad cloth looms, 79,995 narrow cloth looms, and 55,469 hand-looms, totaling 376,704 looms.

Ninety per cent. of the cotton-weaving factories are small-scale industries, which produce various cotton goods with less than ten looms.

Marked improvement in production, capacity and quality of manufactured goods could be possible for the introduction of better type of looms, and in 1934, there were 376,704 power looms. In 1934, Japan produced 874,720,000 yen worth of cotton tissues and exported about fifty-six per cent. of it.

Japan Cotton Spinners' Association, of which the most of the spinning factories are members, acts as the central organisation for the control and improvement of the industry. It controls over-production, dealing in raw materials, sale of manufactured products and employment, settlement of disputes between different countries etc.

In regard to control over employment the Association has a regulation against engaging a worker while in the employ of another without

the permission of the latter, and thus eliminating an evil practice of offering inducements to skilled workers.

Weaving is controlled by the Japan Federation of Cotton Manufacturers' Association and Federation of Export Cotton Tissue Trade Association. The latter undertakes the examination of quality of manufactured goods for export. Under the former all industrial associations are federated and its general object is the control of the cotton trade industry, supervision and examination of manufactured goods, improvement of quality, expansion of markets, encouragements etc.

The following table will enable the reader to understand the financial and other position of the Spinning Companies.

**Equipments of Spinning Companies**

	1929	1930	1931	1932
Number of Companies	70	74	72	71
Number of Mills	258	263	263	265
Ring spindles	6,795,502	7,771,527	7,498,152	7,929,530
Mule	41,014	42,474	36,994	35,320
Doubles	808,324	803,094	801,594	810,492
Looms	77,898	79,466	77,782	79,277

	1933	1934	1935	
Number of Companies	69	72	74	—
Number of Mills	268	275	281	—
Ring spindles	8,608,608	9,495,254	10,649,048	—
Mule	35,320	35,320	35,320	—
Doubles	842,808	868,440	912,912	—
Looms	86,343	91,146	95,982	—

**Financial position of sixty-two companies, which are members of the Spinners' Association.**

**In 1,000 Yen.**

	Latter half, 1931.	First half, 1932.	Latter half 1932.
Number of Companies }	60	63	63
Authorised Capital	506,365	531,015	529,461
Paid up Capital	378,555	386,103	385,675
Reserves	236,281	237,984	240,331
Debentures and loans ...	114,769	125,829	124,297
Fixed Capital	563,381	570,379	570,069
Fixed Capital written off for the term.	10,528	12,081	15,409
Brought forward from preceding term.	30,480	22,086	37,413
Net profit for the term.	22,806	23,544	27,385
Dividend for the term.	17,864	18,126	19,268
Reserve set aside for the term.	2,921	3,006	4,437
Carried forward to the next term.	32,501	24,498	41,093
Rate of dividend (per cent)	9.4	9.6	10

The following statistics will give one an idea of Japan's expansion of oversea trade in cotton textiles.

## Export of Cotton Textiles

Year	Quantity in Yards	Value in Yen
1931	1,413,780,000	198,731,000
1932	2,013,722,000	288,712,000
1933	2,090,228,000	383,215,000
1934	2,577,233,000	492,351,000
1935	2,725,109,000	496,097,000
1936	2,709,885,000	483,591,000

The figures show a striking increase in recent years, both in price and quantity, which speaks of the prosperous position of the industry.

In conclusion, it will not be out of place to say that Japan is not independent in regard to cotton supply and has to buy cotton from America, India, and other places. Some people charge Japan of economic dumping of cotton goods for her advantageous position in exchange. It is, however, difficult to find any justification for such an allegation, when a country has entirely to depend on others for raw materials and buy them in an unfavourable currency position. Japanese cotton mills have made a huge reserve for emergency and improvement,

and in buying cotton they always follow the principle of effecting more transactions when the market falls low and maintaining a stock for one year or a year and a half's consumption, which invariably places them in a position to maintain a favourable level of price.

The independent financial position of Japanese mills enables them to pursue the same sound policy in selling yarn. Japanese cotton manufacturers are financially independent of their agents and bankers.

## RAYON INDUSTRY

The present position and progress of the Japanese Rayon industry is an outstanding industrial achievement due to systematic research both by the Government and private bodies. The low production-cost in manufacturing rayon yarn and fabrics of superior quality has made Japan a formidable competitor in the world.

Between 1918-1925, this industry was only in the experimental stage, but in 1935 Japan could hold the second position in the world in the production of rayon, which not only speaks of her ability and higher efficiency, but proves the volcanic energy and zeal of the nation, which acted behind in bringing the thing to a success. In 1930, Japan produced about three million pounds of rayon, which was four and a half times greater than that of 1931. In 1930, her share was only nine per cent. of the world's out-

put, and she steadily beat down France, Italy, Germany, and England, and came very close to U. S. A, which now ranks first in rayon production. It is very likely that Japan will surpass America in the near future.

The statistics of rayon-production in the principal countries for 1930 and 1935, will help the readers to understand the position more clearly.

### Countries

(In Million Pounds)

Year.	U.S.A.	Japan	Germany	Great Britain	Italy	France
1930	126.8	36.6	59.1	47.0	66.3	50.3
1935	256.7	224.0	90.0	88.9	84.1	60.0

The reimposition of gold embargo was a turning point in the industry which enabled the old concerns to develop their equipments, and at the same time many other new companies were started in view of the bright prospect of the business. The quality of rayon was greatly improved and the quantity of 120 denier was much increased.

Most of the productions were by the viscos process and in 1931, thin multi-filament of one



single yarn, and matted yarn were produced, but since then several innovations have been introduced by several companies.

In 1927, Japan imported 3,300,000 lbs of rayon, but the development of her own industry not only made her self-sufficient, but enabled her to occupy a remarkable position in the world's market. Besides exporting rayon-made goods, she exports about 30,428,000 lbs of rayon yarn, worth 22,853,000 yen, although these figures are variable. Japan exports rayon yarn to India, China, and Manchuria, while the mixed and pure rayon tissues are exported not only to Asiatic countries, but to Africa and America as well.

Japan manufactures pure rayon tissues as well as silk-mixed variety and cotton or woollen stuff mixed with rayon. The experience in silk-weaving has been greatly helpful in the successful adaptation of the production of rayon fabrics. In the production of rayon tissues broad cloth as crepe and figured tissues reach a high figure. The production of different rayon tissues in 1934 was worth 257,662,000 yen. About forty per cent, of the production is meant for export, and in 1935,

Japan exported 424,141,000 Sq. yds. worth 128,243,000 yen.

The price of rayon has of late shown a downward tendency, which is due to sharp increase in production and low manufacturing cost, due to improvements in the manufacturing process. The price quoted for 100 lbs. of 120 denier yarn in 1928, was between 204—280 yen, which in 1930 was 65—185, and in 1935, between 53·1—88 yen.

Japan effected material improvement in not only equipments, but in the entire process of manufacture she economised the cost. The requirement of pulp for manufacturing rayon yarn was considerably reduced, the alkali was almost completely recovered and the utilisation of coagulating liquid also rendered more economical, cost of fuel and labour was greatly reduced for the improvement in the mechanical and chemical equipments.

The cost of production for 120 denier per 100 lbs. ranges between 43—55 yen for first grade manufacturing concerns of Japan excluding depreciation although some of the newly started companies are still unable to produce

it at a cost of less than 60 yen, but this also is much lower compared with other rayon-producing countries. Out of this 60 yen, 11·4 yen goes towards pulp, 18·6 is spent on chemicals, 10·8 for wages, 11·4 for motive power, and 7·8 for working charges.

The production of rayon requires higher chemical research and technique which can be fulfilled in case of small scale industries and as such Japan has followed the principle of increased production unit, and the smallest unit of rayon production in Japan is twenty tons per day, and an initial outlay in equipment per ton is 3000,00 yen.

Sure of the possibility of rayon market, some of the leading cotton-spinning companies have started rayon-producing which not only acts as subsidiaries in hard time, but gives them good business return.

The capacity of producing rayon in various companies varies from 20—60 tons per day. Upto 1933, Japan rayon-manufacturers enjoyed a high profit, which reached 32 per cent. in 1924, and this enabled most of the companies to make a high reserve

and provide for a high depreciation out of most of the profit. The financial strength also has helped greatly in the growing development of their industries.

There is the Japan Rayon Manufacturers' Association, which aims at promoting the interest of the rayon manufacturers—such as enforcing curtailment of production and compulsory exports in order to adjust the demand and supply in domestic market.

At the end of 1935, the position of the principal rayon companies was as follows :

Paid up capital	Net profit	Annual profit rate	Dividend rate
125,500,000	22,331,000	17.8% per cent	14 per cent.

## RUBBER INDUSTRY

Rubber industry is one of the major industries of Japan, the annual production of which, in recent years, has reached one hundred million yen in value. The relative position of Japanese rubber goods in overseas markets bears testimony to the increasing development of the industry.

In consumption of crude rubber, Japan ranked fifth in 1930, when she consumed 33,000 long tons, or 4·8 per cent of the world consumption. Her consumption increased to 74,000 long tons or 8 per cent. of the world consumption in 1934, and ranked third being placed below the United States and England.

The rapid development in rubber manufacture has been possible by the increase of export, which reached 40,193,000 yen in 1935, and the production in recent years reached over one hundred million yen worth. Japan manufactures not only to meet the various requirements of

her home market, the most important of which are tyres of motor cars and cycles, and rubber foot wear, but she manufactures various articles to meet also the special requirements of the oversea market. Amongst the manufactures, tubes of various kinds, toys, belting, and rubber shoes deserve mention.

In 1933, Japan manufactured soft rubber goods to the extent of 84,981,000 yen, hard rubber goods worth 1,724,000 yen, and other goods worth 19,429,000 yen. She manufactured tyres and other accessories worth 31,826,000 yen, articles for machineries worth 1,001,000 yen, shoes and other foot wear 21,879,000 yen, toys 5,563,000 yen, tubes 2,989,000 yen, belting 5,662,000 yen, battery cases 276,000 yen, rubber-soled *tabi* ( Japanese sandals ) 16,553,000 yen, rubber cloth 2,876,000 yen, and other goods worth 17,508,000 yen.

Factories manufacturing toys and rubber shoes are mostly small-scale industries on a cottage industry basis and the factories that employ 5 - 50 workers numbered five hundred and eighty-four at the end of 1933, which is 80 per cent. of the total number. Large scale industries are few, and the number of factories that

employ about 47 workers on an average were 748 only.

Japan receives the major portion of her rubber supply from the Straits Settlements, Netherlands, and East Indies. The enterprise is not confined to homeland only, but the Japanese people have taken active parts in the rubber plantation in Malay Peninsula, Sumatra, and Borneo, and could produce no less than one third of the home consumption in 1933.

Other materials for rubber goods require chemicals, accelerators for vulcanizing, colouring materials and other compounds, and these things are largely supplied by the home producers.

About half the workers engaged by the rubber-manufacturing concerns are women and the number of female workers in factories manufacturing rubber shoes, thin rubber goods and toys is considerably greater than the male workers in bigger factories. Wage differs according to sex, nature of work, efficiency and skill, but the rates between factories and small industry concerns vary. The wage rate in large factories in 1933 was 13 sen and in small industries from 7 to 10 sen, per hour.

Rubber industry is such that it is capable of easy improvement with small capital and it facilitates manufacture of various cheap goods without affecting much the outward appearance of the article only with slight modification in the manufacturing process. The year 1933 registered as many as 333 Rubber-shoe-manufacturing concerns amongst which 245 were individual enterprises. Rubber industries are mostly run on cottage industry basis and the fact that the work is performed by family members and other low-wage labourers render it more profitable.

The growth of the rubber industry gave an excess of export by about forty million yen annually over the imports, of which about 40 per cent. represents rubber-soled canvas shoes. In 1935, Japan exported these shoes worth about 15,500,000 yen, various tyres—9,946,000 yen, rubber toys of 4,200,300 yen and other kinds of rubber shoes 2,700,000 yen; though, however, in 1933, the last article was exported to the extent of 8,200,000 yen and the fall in the figure is said to be due to the protective measures in buying countries.



The following figures showing the extent of export of different kinds of rubber goods during 1935, will further clear the position of the industry, which Japan occupies.

Rubber soled tabis ( Japanese sandle )	Yen 1,270,000
Rubber shoes	2,699,000
Rubber-soled canvas shoes	15,514,000
Rickshaw Tyres	654,000
Bi-cycle Tyres	5,240,000
Motor car and other Tyres	4,052,000
Rubber Toys	4,195,000
Other rubber goods including ebonite materials	6,568,000
Total	<hr/> 40,193,000

## SILK INDUSTRY

The raw silk industry of Japan is one of the most important industries, which supply at present no less than eighty per cent. of the demand of raw silk all over the world. Japan did not enjoy this position of silk trade from time immemorial, but she has attained this position by her steady improvement and development of various aspects in the productions of cocoons and reeling industry.

The silk industry may be chiefly divided into two stages, (i) production of cocoons and (ii) reeling of raw silk from the cocoons. The former devotes to the growing of mulberry leaves, egg production and raising of cocoons, while the latter attend to stifling and reeling. Between these two main stages many operations are involved.

The silk industry in Japan embraces agriculture, manufacturing and commerce, which is subdivided under the following seven branches :

(1) Growing of mulberries, (2) Hatching of eggs, (3) Production of cocoons, (4) Sale of cocoons, (5) Reeling, (6) Sale of raw silk, (7) Export.

Silk industry is, therefore, a chain of industries connected with the production and distribution, and starting from the production of cocoon to supply of raw silk, which ultimately is utilised in the manufacture of silk tissues etc. As sericulture is a subsidiary branch of agriculture, it will not be out of place to discuss here about the average income of the Japanese farmers and their position.

The average gross income of a Japanese farmer from agriculture as furnished by the Ministry of Agriculture in 1933, was 726.08 yen. Of this, rice covered 52 per cent, other crop 16 per cent, sericulture 15 per cent, and income from other sources 17 per cent. Gross expenditure was 421 yen and this represented about 43 per cent. But for a small tenant farmer, it was 53 per cent. and for farmers cultivating their own land, it was 36 per cent. The income represents the cost of agricultural products, sericulture, livestock, poultry, and agricultural

manufactured products. Expenditures comprised rent amounting to 31·7 per cent, manure 22 per cent, fodder 8·5 per cent, labour 3·7 per cent, interest on loan 3·4 per cent, taxes and other contributions 9·8 per cent. It is to be mentioned here that sometimes the farmers have to pay higher rates of interest on loan and high rent on tenanted lands. To better up the conditions of farmers, who are passing through economic depression, Government have organised Economic Recovery Committees in municipal areas and rural districts, who are entrusted with the duty of working out plans and effecting improvements by such measures as equitable division and utilisation of land, better facilities of capital and labour, control of production and distribution, reduction of the cost of production, reform of existing organisations, training leaders amongst the farmers, stabilising the price of manure and granting of loans etc.

The main characteristic of the silk industry is that though the reeling is done by the help of motive power, the industry is dependable on manual labour from the very raising of cocoons to silk-reeling.

The average annual cocoon output during the five years from 1929-33, was about 406 million yen worth which is about eleven per cent of the value of total primary production. During this period the average raw silk production was worth 573 million yen or eight per cent. of the total value of the entire industrial production. This very fact clarifies that silk industry occupies a very important position in Japan, and is of special importance to agriculture, and the rise and fall of the industry have a direct effect on the agricultural economy. Silk-industry is an essential element in the balance of foreign trade in Japan.

The predominance of Japan in the world in regard to silk-trade is clear from the fact that in 1934 Japan produced 82·3 of the world output, China 11 per cent. ( though her share was comparatively large beforehand ), Italy 4·9 per cent, and 1·8 per cent the rest of the world in which India is included.

The following table will further clear the position of the output of raw silk in different countries.

## PERCENTAGE OF WORLD PRODUCTION OF RAW SILK

Year	Japan	British India and Indo-China	China	Near East and Central Asia.	Spain	Italy	France
1922	51.9	0.2	37.8	1.5	0.2	7.9	0.4
1925	55.1	0.2	34.4	2.0	0.2	7.1	0.5
1929	61.5	0.1	29.3	1.9	0.1	6.8	0.3
1932	75.7	—	16.7	1.2	0.1	6.2	0.1
1933	76.8	—	15.6	1.5	0.1	6.0	0.1
1934	82.3	—	11.0	1.6	0.1	4.9	0.1
1935	78.8	—	10.9	—	0.08	4.2	0.13
1936	74.7	—	9.9	—	0.11	8.03	0.14

In 1935, Japan exported raw silk worth 880 million yen, but owing to the world-wide depression the price level having declined to a great extent, the average of export for five years ending 1935, became 362 million yen. Japan has to import most of the raw materials for manufacturing her exportable goods, but so far as silk is concerned, it is not being offset by import of raw material and as such can be applied to the reduction of the generally unfavourable trade balance. The following table will make the position more clear.

Percentage of Raw Silk Export  
to  
Total Export Trade

Year	Export (in 1,000 yen)	Ratio to Total Export Percentage
1870-74 average	6,111	33·2
1900-04   "	71,871	27·1
1910-14   "	152,149	28·6
1925-29   "	774,713	37·0
1925       "	879,657	38·2
1929       "	784,150	36·5
1930       "	419,107	28·5
1931       "	356,932	31·1
1932       "	382,950	27·2
1933       "	391,192	21·0
1934       "	287,084	13·2
1935       "	389,609	15·7
1936       "	393,463	

In recent years the depression considerably brought down the price of raw silk, which affected the cocoon raising and reeling industries, but on the other hand, it benefited the industry by bringing about improvements in different phases of the same. The alertness of the Government is responsible for the greater

output of cocoons per unit of hatched eggs and yield of mulberries per acre. Then also as a result of improvement in the home-made reeling machines (the cost of which is from 250-300 yen per cauldron) the efficiency per cauldron was increased, and this brought about, from year to year, a decrease in the cost of production, which augur well for further development of the industry.

Though some people are pessimistic about the future of raw silk owing to the recent development in rayon industry, it is noteworthy that the world consumption of raw silk has maintained a comparatively high level in spite of the depression. Then again, the use of raw silk in fashionable dress materials, ladies' socks, manufacture of bandages, war materials and parachutes will always keep alive the demand for raw silk. Moreover, a time might come when the rayon producers might be confronted with the shortage of pulp materials.

To mitigate the effect of depression Government have been obliged to exercise their official power now and then, while voluntary measures are resorted to by those that are



engaged in the industry. In 1932, accumulated stock was purchased by Government to the extent of 100,000 bales (each bale weighing about 133·3lbs), the cost of each bale ranging from 600-900 yen. Due to the adverse situation faced by the silk industry, political parties were obliged to press the Government to treat it as an important political issue and Government were compelled to take up a policy ensuring better control of the industry in permanent measure. The policy aims at a state control over the supply of silk-worm eggs for the standardisation of cocoons and also at the quality of raw silk and the establishment of a license system to secure consolidation in the silk-reeling industry.

In 1915, a little over 1,670,000 agricultural households were engaged in cocoon-raising, which, in 1929, rose to 2,217,000, and this figure represents forty per cent. of the total number of farming households. In 1935, it again decreased to 1,900,000. In 1915, the area under mulberry was about 1,108,000 acres, which, due to the Government encouragement for the readjustment and replantation of mulberry, reached 1,557,000 acres in 1934.

### Number of Sericulture Households and Area under Mulberries

Year	Number of Sericultural Households	Area under Mulberries
	( In 1, 000 )	( In 1, 000 cho )
		1 cho = 2.45 acres
1925	1,949	549
1929	2,217	626
1930	2,216	714
1931	2,120	683
1932	2,065	653
1933	2,093	640
1934	1,995	623
1935	1,895	582

As has already been said, Sericulture industry holds a very important position in Japanese agriculture and is practised in most cases by small farmers as a side line of agriculture, and the quantity of cocoons produced was approximately 6,580,550,000 lbs. in 1935. The production of cocoon has steadily increased and the average for the last five years rose to 254 against an index of 40.7, preceding 1931, showing a tremendous increase during the last twenty years.

The output of cocoons, both yellow and white, from 1910-1935, will be found interesting ;

the ratio of white and yellow cocoons being 3 : 1.

### Output of Cocoons

In 1,000 Kwamme.

1 Kwamme = 8·2673 lbs.

Year	Total Output	White Cocoons	Yellow Cocoons
1910-14	43,185	—	—
1925-29	91,666	71,252	20,415
1925	84,800	69,615	15,185
1929	102,093	76,361	25,732
1930	106,646	76,729	29,734
1931	97,072	68,440	28,633
1932	89,550	66,073	23,478
1933	101,164	75,794	25,639
1934	87,140	64,616	22,523
1935	82,066	68,967	13,099

The combined total cost of mulberries and labour represents approximately eighty per cent of the total cost of production and any variation in cost always has a direct effect on the cost of production of cocoon. Cost of mulberry leaves in raising cocoons is approximately fifty per cent. of the total cost as fertiliser is the main item for growing mulberry leaves supplemented by labour.

## Cocoon Prices

In Yen per Kwamme.

1 Kwamme=8.2673 lbs.

Year	Price of Ordinary Quality*		Price of best Quality†	
	Spring Cocoon	Summer & Autumn Cocoon	Spring Cocoon	Summer & Autum Cocoon
1923	9.99	10.53	11.40	9.11
1925	7.82	8.25	11.25	10.07
1927	7.48	7.13	7.18	4.77
1929	6.99	6.25	7.57	6.53
1931	3.78	3.45	3.08	2.96
1933	3.82	3.76	6.25	4.27
1934	3.56	3.74	2.52	2.38
1935	3.54	3.96	3.81	5.37
1936	4.20	3.00	5.15	4.35
1937	3.90	—	5.60	—

In cocoon production the next important item is the wages of labour, which is about thirty per cent of the total cost. The industry at present depends almost on domestic labour, as cocoon-raising is carried on by individual households. According to the investigation of the Ministry of Agriculture and Forestry, in 1934, sericulture depending on individual family

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\* Investigated by the Cocoon Union of Silk Trade Association (later the Federation of Cocoon Producers' Association),

† Figures up to 1935 investigated by the Ministry of Agriculture.

labour were more than eighty-three per cent. of all sericultural households.

### DISPOSAL OF COCOONS

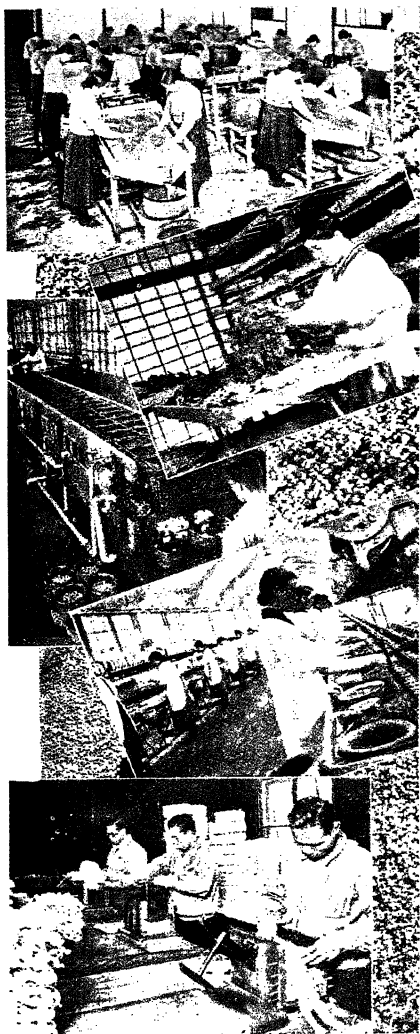
In Japan cocoons are disposed of in various ways. They are sold raw or dried, consigned to co-operative mills for reeling, reeled on commission or disposed of otherwise. Cocoons are sold on individual or joint accounts under license or otherwise, or special agreement. In 1933, raw silk sold in the open market was to the extent of 73·3 per cent. of the total output, 12·9 per cent. consigned to the co-operative mills for reeling, or reeled jointly by the producers, 8·9 were sold dried, and 0·9 per cent. reeled on commission or disposed of otherwise. To secure equity of price in the disposal of cocoons, Government endeavours to popularise the sale of dried cocoons and with a view to this it has adopted various measures to encourage the formation of associations to dry cocoons jointly and also grants subsidies to the cocoon-drying ware-houses.

The reeling is done by the co-operative

societies or individual concerns, of which the farmers represent quite a large number. In 1933, there were only 473 co-operative reeling mills out of an aggregate of 3,245 and the number of cauldrons in the co-operative filatures were 50,167 out of a total of 322,762, the balance accounting for the commercial enterprises.

Filatures can be divided into three groups, (i) machine reeling, (ii) hand reeling, and (iii) Dupion (double cocoon) reeling. The first occupies the major portion of the industry and produces raw silk for export, while the outturn of the other two are mostly to meet the demand of home market for lower grade materials. The ratio of machine-reeled silk covers well over ninety per cent. and the ratio of hand-reeled silk has gradually fallen below 3 per cent. and the Dupion silk accounts for about six per cent. The production of white and yellow silk is in the ratio of 3 : 1. About thirty per cent of the net cost of raw silk is accounted for by reeling and 70 per cent. is the cost of cocoons.

The reduction in the cost of production of raw silk has been possible for the introduction of twenty reels filature machines.



Five stages in the manufacture of raw silk.

Top : Washing with water, which is a necessary step in preparing egg cards.

Second : Feeding silk-worms with mulberry leaves.

Third : Mechanical boiling of cocoons for silk reeling.

Fourth : Drawing out filaments from cocoons to start reeling.

Bottom : Pressing and packing yarn into books of skeins.

Silk Industry





## Average Cost of Raw Silk Production per 100 kin for 1934

Heads of expenditure	Common Enterprise Co-operative Enterprise					
	Value	P. C.	Value	P. C.	Value	P. C.
Salaries and bonus to staff	9.60	5.5	9.37	5.4	12.8	6.7
Wages, allowance, and bonus of operatives	53.50	30.9	53.12	30.8	57.75	31.6
Fuel	15.45	8.9	15.08	8.7	19.59	10.7
Electric power and light	3.08	1.8	3.02	1.8	3.65	2.0
Provisions	15.00	8.7	14.92	8.7	15.99	8.8
Insurance	1.52	0.9	1.49	0.9	1.97	1.1
Packing Charges	1.74	1.0	1.79	1.0	1.48	0.8
Commission for Sale of Raw Silk	6.54	3.8	6.56	3.8	8.49	4.6
Commission for agents in cocoon Purchase	4.69	2.7	4.86	2.8	1.28	0.7
Commission for drying cocoon	4.78	2.8	5.09	3.0	1.29	0.7
Charges for recruiting operatives	0.25	0.1	0.24	0.1	0.35	0.2
Storage	1.26	0.7	1.24	0.7	1.44	0.8
Cartage	6.82	3.9	7.08	4.1	4.02	2.2
Correspondence	0.97	0.6	0.98	0.6	0.86	0.5
Travelling Expenses	2.64	1.5	2.73	1.6	1.72	0.9
Taxes and rates	3.42	2.0	3.62	2.1	1.21	0.7
Interest	17.05	9.9	16.62	9.6	21.89	12.0
General Expenses	2.23	1.3	2.20	1.3	2.61	1.4
Ground rent	0.66	0.4	0.64	0.4	0.86	0.5
Repairs	4.56	2.6	3.25	1.9	4.46	2.4
Miscellaneous	14.01	8.1	4.50	2.6	5.29	2.9
Benevolent Institutions	3.34	1.9	13.08	8.1	14.26	7.8
Total,	173.11	100.0	172.36	100.0	182.64	100.0

The average cost of raw silk in 1934 was 534 yen, in 1935, 717 yen. Out of the entire export, Japan exports about 85 per cent. to America, 12 per cent. to European countries and the rest to the Asiatic countries.

**Number of Operatives in Silk-reeling Industries**

	1926	1930	1931	1932	1933	1934	1935
Male	33,062	36,830	36,185	30,120	28,055	27,450	26,174
Female	450,280	472,296	459,264	398,643	366,972	335,060	321,339
Total	483,342	509,124	495,449	428,763	395,027	362,510	347,513

In reeling industry commercial banks hold the foremost place among financial institutions and next to that is the wholesale dealers. Besides, Central Bank, Co-operative Societies, and other organs supply money to certain extent.

Export of raw silk from Japan is estimated at about seventy per cent. of the total output and of the total export volume, as has already been said, the United States imports the bulk of it. Thirty per cent. of the total output of raw silk is consumed at home for the manufacture of various pure and mixed silk goods and this has been possible owing to the introduction of modern manufacturing processes. For advancement in technique in

both dyeing and weaving it has become possible

Export of will be found interesting.  
The quantity These figures exclude the  
export figures

Europe	Qua	1934		1935	
		Quantity	Price	Quantity	Price
England	3,3	22,898	14,224	28,454	21,458
France	11,6	36,759	20,397	35,167	23,928
Italy	1,0	1,596	1,005	170	132
Switzerland	2	180	106	385	266
Others		539	303	1,800	1,096
Total.	16,3	61,972	36,055	65,676	46,883
North America	453,4	433,739	224,454	467,203	329,213
Canada	3,8	757	411	120	71
Total.	457,2	434,496	244,865	467,323	329,284
India		4,367	1,890	13,802	5,577
Australia		5,523	4,017	5,081	4,233
Others		548	257	3,114	1,814
Total.	3,3	10,438	6,164	21,997	11,624

Export of Raw Silk from 1930 to 1935 by different countries. The quantity is given in 1,000 picul, and price in 1,000 export figures for Dupion Silk.

Europe	1930		1931		1932		1933
	Quantity	Price	Quantity	Price	Quantity	Price	Quantity
England	3,350	2,912	9,244	6,160	12,957	9,256	18,383
France	11,691	3,180	3,180	1,976	12,146	7,165	21,059
Italy	1,022	289	141	40	1,809	1,072	1,465
Switzerland	264	193	169	118	210	116	207
Others	10	7	10	7	10	5	—
Total.	16,339	12,007	12,744	8,301	27,132	17,614	41,115
North America	453,517	400,322	540,158	343,836	513,402	360,285	437,624
Canada	3,865	3,557	2,830	2,594	1,748	1,174	275
Total.	457,382	403,879	544,488	346,430	515,150	361,459	437,899
India	259	125	250	145	335	565	722
Australia	2,783	2,782	2,809	1,928	4,417	31,164	4,156
Others	561	313	286	127	507	103	143
Total.	3,603	3,220	3,345	2,200	5,259	31,832	5,021

The average cost of raw silk in 1934 was 524

both dyeing and weaving, it has become possible for the silk-manufacturing industry to produce superior quality of goods.

#### Export of Raw Silk

	1919	1925	1929	1932	1933	1934	1935
U. S. A.	96.2	96.5	96.6	93.7	90.5	83.7	84.4
Europe	3.5	3.3	2.4	5.1	8.2	11.7	11.5
Other Countries	0.2	0.2	1.0	1.2	1.3	4.6	4.1

From the following table it will be found to what extent the manufacturing industry has advanced and to what point the export mark reached.

#### Production and Export of Silk Tissues

( In Million Yen )

Year	Silk Tissues	Mixture	Rayon Mixture	Total	Export
1931	329	23	97	448	73.4
1932	323	21	105	449	49.6
1933	313	21	122	456	59.2
1934	323	22	150	495	80.4
1935	341	24	200	565	101.6
1936	301	30	306	637	217.1

The export of crepe is the most important in value, being followed by Fuji silk. The recent development in the production of spun silk is worthy of note, which is steadily making a headway. Of manufactured silk, Japan

manufactures *Habutae* (plain white light silk tissues), Satin, Taffeta, Chiffon Pongee, Fuji silk, Georgette, Crepe, Velvet, and silk socks etc.

Government spend no less than 13,538,657 yen per year for the improvement of the Sericulture industry, and this, when sub-divided into different heads, will be found as follows :

	Yen
A. Government Sericultural Bureau	10,324,153
B. Sericultural Experimental Station	1,385,485
C. Yokohama Silk Conditioning House	1,077,064
Kobe Silk Conditioning House	609,007
D. Raw Silk Intelligence Bureau	135,348
E. Raw Silk Export Registration Office	7,600

The following heads will show the items of expenditures in detail :

#### A. Government Sericultural Bureau

Sericultural Bureau	41,723
Aids to Protection of Disease of Silk Worms	83,283
Sericultural Improvement	4,966,134
Agricultural aid	476,281
Research for Promotion of raw Silk Export	128,854
Society for Improvement of Sericulture Industry	200,000
Grant in Aid of Sericulture and Protection against diseases etc.	437,982
Sericulture promoting Subsidy for Prefecture	
( <i>Okinaga</i> )	31,346
( <i>Kagoshima</i> )	32,228
Protection of Snow and Frost Injury	16,320
Total	10,324,153

**B. Sericultural Experimental Station**

Sericultural Experiments	472,086
For Experiments and Research	123,420
For Improvement of Sericulture	589,190
Aid of Agriculture	26,452
Summer and Autumnal Sericultural Research	177,337
Total	<hr/> 1,385,485

**C. Yokohma Silk Conditioning House**

Raw Silk Conditioning ( for export )	1,063,483
For Aid of Agriculture Improvements	13,575
Total	<hr/> 1,077,064

**Kobe Silk Conditioning House**

Raw Silk Conditioning ( for export )	602,582
For Aid of Agriculture Improvement	6,425
Total,	<hr/> 609,007

**D. Raw Silk Intelligence Bureau**

For Aid of Sericultural Improvements	122,412
Salaries of the Staff and Sundries	12,938
Total.	<hr/> 135,348

**E. Raw Silk Export Registration Office**

Yokohma	4,338
Kobe	3,262
Total	<hr/> 7,600

In conclusion, the author desires to mention that there are about 5,600,000 farm-houses in



Japan, of which forty per cent. are engaged in silk-raising. 180-190 million grams of silk-worm eggs are annually hatched, which produce about 750,000,000 to 830,000,000 lbs of cocoons. In reeling, the average output per basin is 241 lbs. and the annual output of filatures is about 80,000,000 lbs or 640,000 bales, valued about eight hundred million yen. Besides this there are about 8 million pounds of hand-reeled and Dupion silk. Average cocoon crop per acre of mulberry is estimated at 360 lbs from which 40 lbs, of raw silk can be produced.

Total world production of cocoon in 1933 was 535 million kilogram, out of which Japan with colonies produced 401 million kilograms.

#### Production of Cocoon in Japan Proper

In million Kwamme.		1 Kwamme=8.2673 lbs
Year	Quantity	Price (In million yen)
1932	89.6	296.8
1933	101.2	500.1
1934	87.1	203.8
1935	82.1	350.9
1936	82.3	396.6

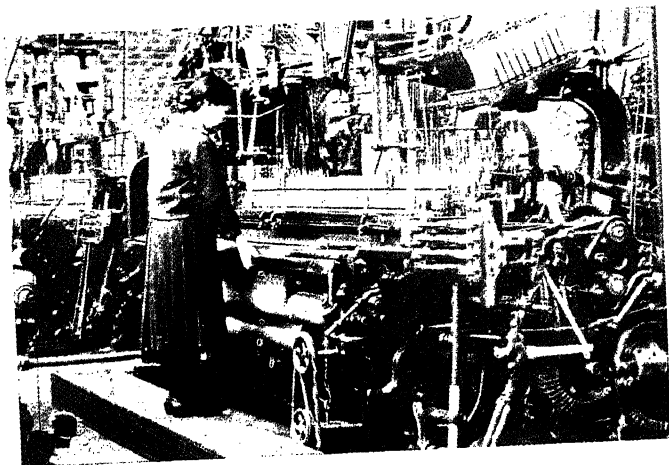
The reeler girls in Japan get on average 70 sen per day, and the working hours in a

filature factory is from 10 to  $10\frac{1}{2}$  hours. Average output per reeler girl in filature factory are about 1,200 grams of raw silk per day, and when the bonus is included, the average income of an operative becomes about 48 yen per month for a filature factory having 50-200 cauldrons ; 51 yen for a filature possessing 200-500 cauldrons ; and 56.5 yen for a factory with 500-1,000 cauldrons.

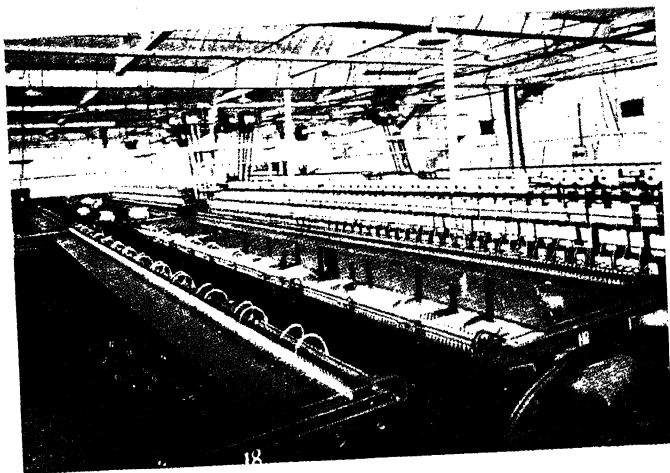
## WOOLLEN INDUSTRY

Japan's woollen industry, though of very recent origin, has made a remarkable progress owing to depreciation of the value of yen followed by the gold embargo of 1931 and a self-sufficiency drive. Up to 1931, she was only producing thin cloth and was importing serge and other woollen cloth to meet the home demand. Since then Japan's enterprise has enabled her not only to produce the bulk of her domestic requirements, but also to export woollen goods to other countries, including England, which no doubt reflects credit on Japanese enterprises.

She has to depend entirely on foreign supply for wool, and she purchased 193,092,000 yen worth wool in 1935, the bulk of which was imported from Australia. Of late, she has been endeavouring to produce wool not only in her own land, but in Manchuria as well.



Wool Weaving



Wool Spinning Factory



In recent years Japan has expanded the combing plants and effected improvements in the process of manufacture, which has led to the increase of output and in 1934, she produced 166,067,000 lbs of woollen and worsted yarns. At the end of 1934, Japan had the following number of wool-spinning machines :

Number of Mills,	Worsted Combing machines,	Mules.	Ring	Wool Carding machines	Mules
33	1,164	559,120	163,166	186	91,272

The foreign import of woollen goods was checked by higher tariffs against import and also owing to the depreciation in the value of yen.

Japan exports her woollen goods to India, China and Manchuria, and the worsted yarn to Europe, South America and England. In 1929, she imported 7,483,000 lbs of woollen yarn, worth 18,746,000 yen, which dropped down to 1,076,000 lbs, worth being 1,930,000 yen. Home consumption of woollen yarn in Japan at present is more than one hundred million pounds.

One of the contrasting features in Japanese woollen industry is that though the yarns are

produced by modern mills, weaving is carried on by small enterprises in rural districts. Serges and similar tissues are produced on a small scale, but on an interlocking system, while textiles suited to large scale production are manufactured by the large scale factories.

In 1934, Japan produced fine woollen cloth worth 50,484,000 yen, flannel worth 3,062,000 yen, serge for *Kimono* 29,627,000 yen, serge for suiting 114,433,000 yen, woollen cloths of other varieties 36,711 yen and blankets 6,58,000 yen, making a total of 264,131,000 yen.

The export statistics discloses that Japan imported, in 1924, wollen goods worth sixty-four million yen, which dropped down to thirty-five million yen in 1927, and in 1935 to seven million yen only, owing to the development of her own woollen industry. On the other hand the export steadily increased, reaching 32,401,000 yen in 1935.

The industry, from the standpoint of business management and factory operation, followed the principle of large scale enterprise. On the other hand small and medium factories have largely developed to meet the export demand

of woollen goods all the world over and have been quite successful in this respect.

Wages paid in smaller factories are lower than in larger factories and the percentage of female operatives is higher in the former case than in the latter and the wages of female operatives vary between 71 to 87 sen, per day.

One of the most important features of the woollen industry is that it has stimulated the growth of companies specialising in spinning, which have shown better results than the factories that carry on spinning and weaving both.

There are Federation of Muslin Weavers' Association, Japan Woollen Industry Association, which not only work for adjusting production, but they were instrumental in securing protective tariff for woollen goods and in securing a reduction in freight rates from the ship-owners on Australian wool. The industry has been steadily improving and made about 12 per cent. profit in 1935. A comparison of the industry as in 1929 and 1935 will make the position more clear.



Year	Number of Companies (large mills)	Paid up Capital (in 1,000 yen)	Net Profit	Profit- rate	Dividend
1929	8	86,916	9,359	10·8	5·1
1935	10	77,242	9,528	12·3	9·2

The rate of profit in the latter half of 1933, was, however, 17·5 per cent. The following table will give an idea of the consumption of woollen and worsted yarn and the enormous development attained by the woollen industry.

**Domestic Demand & Supply of Woollen and worsted Yarn**  
( In 1,000 lbs. )

	1929	1930	1931	1932	1933	1934	1935
Production							
at home	64,302	55,048	77,587	89,661	101,361	103,246	209,470
Imports	7,488	8,011	9,550	3,219	1,688	920	1,076
Exports	371	617	698	1,289	3,168	5,920	5,277
Home- Consumption	71,414	62,442	86,489	91,591	99,881	98,246	—

Small and medium woollen factories contribute much towards the export of Japanese woollen goods. One of the mentionable factors in this industry is the reversion of cotton weavers in some prefectures from cotton fabrics to woollen tissues, and this fact points to the capacity of quick adaptability on the part of the Japanese people. They have highly developed the

technique of serge weaving and other foreign style cloth. In 1932, Japan had 19,518 weaving looms, which produced 121,357,000 yen worth of woollen fabrics, and a larger quantity of this was produced by small enterprises possessing a unit of twelve looms, while the weaving mills possessed as many as 372 looms each on average at that time.

## PAPER INDUSTRY

Japan's paper-manufacturing is one of the first grade industries, which, since 1913, has made a remarkable progress. The outbreak of the last world war and consequently the decrease of paper-production in Europe led to the development of Japan's present-day paper industry, and as a result, several new mills were established, and those that already existed were appreciably improved. This resulted in raising the volume of production from 375 million pounds in 1929 to 2,050 million pounds in 1935.

Japan manufactures various kinds of paper, such as printing paper, writing and drawing paper, cigarette paper, *semali* paper, wrapping paper and news-printing paper, paper boards, and Japanese style paper.

Japanese style paper is mainly a product of household industry on small scale or as a side line of occupation of the farmers. About two hundred million pounds of this kind of paper is produced in Japan.

Ninety-six per cent. of the total production of paper is manufactured by the paper mills. At the end of 1935, there were about seventy-six paper mills with a monthly productive capacity of 63,483,370 lbs, which included also low grade of printing papers.

In Japan about 94 per cent. of the paper is manufactured from wood-pulp, 3 per cent. from waste paper, and 3 per cent. from paddy straw and rags. Paper boards are manufactured from straw, and Japanese style papers from *Kozo* ( paper mulberry ), and other plants.

The consumption of wood-pulp in 1935, was 832,481 ton, of which about 75 per cent. was supplied by Japan herself. Since pulp is largely used in the manufacture of rayon, Japan has to secure supply of this in a larger quantity from outside also. Of the out-side supply, the major portion she receives from Sweden, Norway, America, Canada and Manchuria.

But Japan has since devoted her energy to the extraction of pulp from the pulp-wood, and she is now following a definite plan with a view to increase her supply of pulp-wood.

Large enterprises undertake both paper

manufacture and pulp production and they are ever responsive to the technical rationalisation of the industry. News-print and such other papers are usually low-priced papers and require a mass production of uniform quality.

In Japan, Oji Paper Mill is the biggest, which practically monopolises the entire field of paper manufacture, and its output of paper represents about eighty-one per cent. of the entire production of paper.

In the field of news-printing paper or pulp-manufacture, the Oji Paper Mill contributes about 95 per cent. of the total production of Japan.

The manufacturing of paper board is conducted by comparatively small concerns. The technical progress in the paper manufacture has been accelerated by the market depression, for, as a consequence of the latter the manufacturers concentrated their effort on the technical improvements and reduction in the cost of production. Their effort has been a success ; the cost of production has been reduced to the extent of twenty-nine per cent from 1920—1932, and in later years still further.

The average manufacturing capacity per minute of a news-printing paper mill is from one thousand to twelve hundred feet and that of printing paper about four hundred feet. In 1935, Japan produced 1,720 million pounds of paper, of which printing paper (ordinary) was 171 million, writing and drawing paper 59, Semali 126, art and flint glazed paper 34, news-print 736, roll paper 46, coloured paper 13, wrapping paper 213, Japanese style paper 29, paper board (except straw board ) 80, and miscellaneous paper 59 million pounds.

Japan requires not only a huge supply of news-printing paper, but paper of other kinds also for various other publications and literary works. Japan has, therefore, to depend on the supply of papers from other countries and she imported as much as 167,492 million pounds of various kinds of paper in 1935. Her export to countries abroad including India and China was 199,957,000 lbs in 1935.

In Japan, of the various items of costs in connection with the manufacture of pulp, 40-50 per cent represents the cost of wood, motive power, wages and sulphur. As the wood for

pulp-making is generally sold by the Government, the price is less affected by the fluctuation of market which, however, is controlled on the basis of price of imported pulp.

The Japan Paper Manufacturing Association effect a centralised control over the major portion of paper industry, which produce, about 96 per cent. of the paper and 98·5 per cent. of the entire pulp of Japan.

At the end of 1935, the position of paper industry was as follows :—

Paid up capital.	Number of factories	Machine Number	Inches
160,514,000	46	172	16,541
Number of Operatives.		Output in lbs.	
Male	Female	Total	
14,124	2,652	16,776	1,719,637,000 *

In Japan, the paper manufacturing industry is making a great headway, from year to year, and the mills are equipped with the latest machineries, imported from foreign countries. And, indeed in the field of manufacturing paper, she is in no way inferior to any occidental country.

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\* In 1934, the output was 1,564,358,000 lbs.

## SUGAR INDUSTRY

Formerly Japan had to depend for sugar almost entirely on the foreign supply, but since the annexation of Taiwan ( the South Sea islands ), which is quite suitable for sugarcane-plantation and the development of beet-sugar industry in North Japan of Hokkaido, she has not only been able to meet the entire home consumption, but has occupied an important position also in Asiatic markets, chiefly in competition with Java sugar.

In 1931-32, her production capacity was 1,148,000 tons or 19,300,000 piculs ; in 1934-35, 19,536,000 piculs ; and in 1935-36, 20 million piculs. Since 1913, sugar industry has attained an important position among the prominent industries of Japan.

The development of Japan's sugar industry is chiefly due to the protection and necessary assistance afforded by the Government, and to



the low exchange rate of yen. About eighty to ninety per cent. of Japan's sugar is produced in Taiwan, whose share in 1934-35 was 16,104 piculs, and in 1935-36, 16,749 piculs. Sugarcane plantation in Japan proper is, however, negligible.

Government does not merely encourage various improvements in the manufacturing process, but its department of Agriculture actually looks after the yield of sugarcane in a given area. The various technical improvements have resulted in the increase of percentage of extraction from sugarcane—a thing which is largely responsible for the economic production of sugar. And the research section of the Agricultural Department of sugar mills are ever active in finding out better means of extraction.

The technique of sugar-refining has also been greatly developed and in recent years foreign sugar is found to have been imported in large quantities for re-exportation purpose after refinement.

In 1935, Japan exported 2,669,200 piculs of sugar worth 7,577,000 yen to China, Manchuria, and India etc. The sugar industry of Japan shows a steady increase since 1932, the per-

centage of profit being 13·6 in 1932, 17·7 in 1934, and 19·7 in 1935.

The following statistics of six principal sugar concerns will further explain the position of the industry.

Year	Paid up Capital (in 1,000 yen)	Net profit (in 1,000 yen)	Rate of profit	Rate of Dividend	Profit left in business (in 1000 yen)
1928	166,744	3,865	2·3	8·6	19,411
1931	159,710	12,268	7·7	7·7	1,027
1935	172,251	33,958	19·7	9·7	15,835

In case of sugar industry also the companies try to keep a considerable fund in reserve for improvement purpose and tiding over unfavourable times.